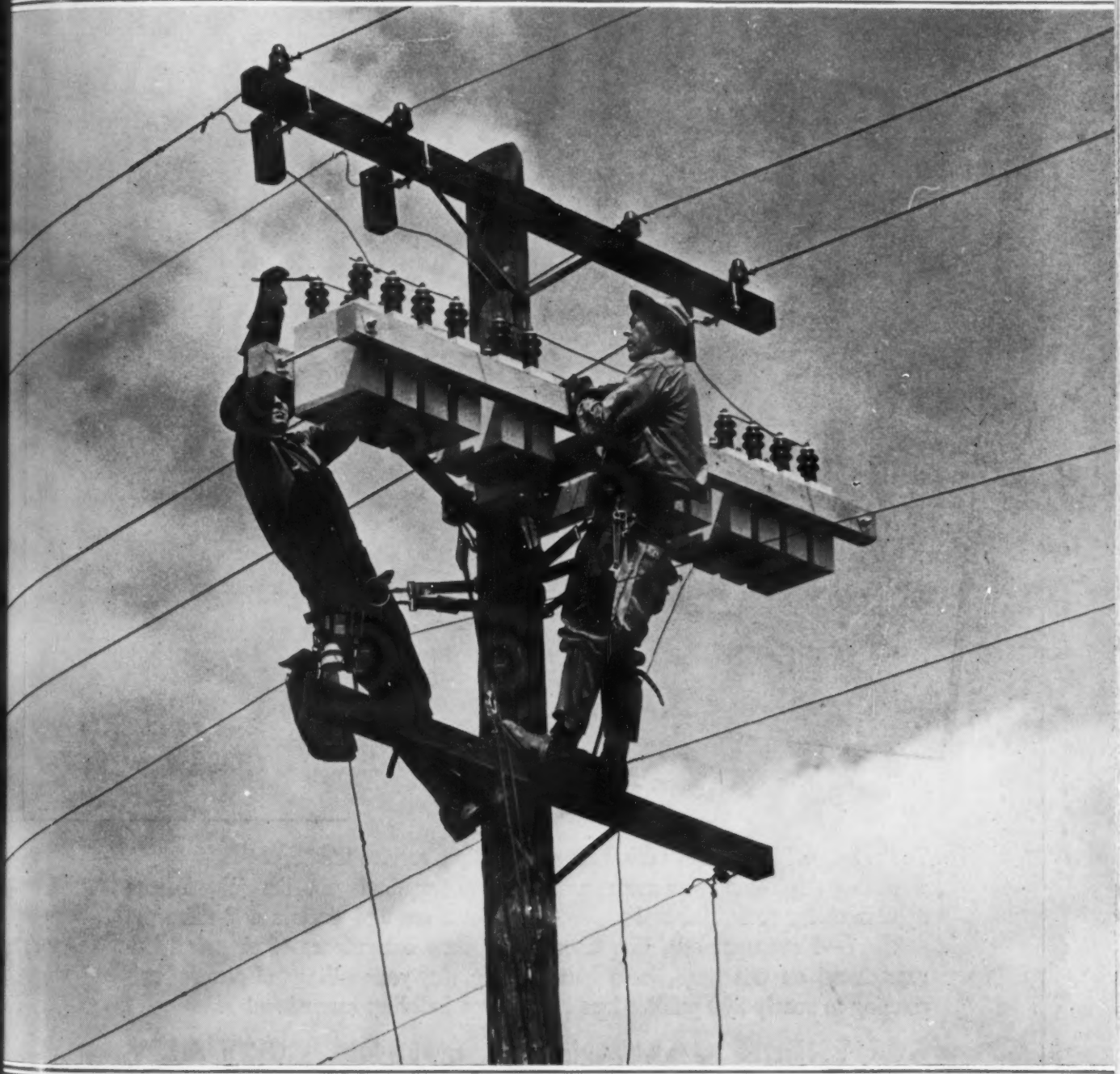
LECTRICAL
VEST

August, 1947
25 cents



Engineering In Pictures, Page 62
Appliances, Page 84

KESMAN FOR THE MOST HIGHLY ELECTRIFIED REGION OF THE U. S.

To the ladies, bless 'em, it's *all-electric* when they think about new ranges and appliances for their kitchens!

Why?—Newspaper ads, like those reproduced on this page, have been running in nearly 200 publications in Edison service territory.

Everlastingly on the job, Edison tells them and dealers sell them the modern convenience of electrical living. Key your selling to Edison's business building campaigns!

SOUTHERN CALIFORNIA EDISON COMPANY

Order Today!

INCREASE TESTING OUTPUT AS MUCH AS 50 PER CENT

***NOW*—the label "For Immediate Delivery" has been applied to General Electric's photoelectric watthour-meter tester—the tester that in more than five years' wide usage in the field has been proved to offer two fundamental advantages: saving in testing time and improved accuracy —resulting in reduced testing costs. Now, no delays—just place your order and it's on the way to you.**

USE OF "ELECTRIC EYE" PRACTICALLY ELIMINATES TESTING ERROR

Since the testing process is entirely automatic and the meter does not have to be watched during the test run, operators are free to do other essential work. Furthermore, the accuracy of this testing equipment—4/1000 of one per cent in one revolution of the meter disk—makes long running time unnecessary and eliminates the need for repeat runs to confirm the accuracy of the first reading. This means that running times are reduced to approximately one-half those of the old non-automatic testing procedure.

For further information about this electronic tester—how it works, how you can plan savings in test procedure, and how the equipment can be put to many other uses—contact your General Electric representative. *Apparatus Dept., General Electric Company, Schenectady 5, N. Y.*

HEADQUARTERS FOR MEASUREMENTS

GENERAL ELECTRIC

001-2

AUGUST 1947

SPOKESMAN FOR MOST HIGHLY ELECTRIFIED REGION OF THE U. S.
The all-industry magazine of progress, established 1887, and incorporating the "Electrical Journal", "Journal of Electricity, Power and Gas" and "Journal of Electricity". Contents Copyright. Sixtieth year of publication.

ELECTRICAL WEST

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NEXT MONTH

At the beginning of the lighting season it is customary to furnish the West's electrical people with the latest trends and ideas in lighting. Both pictorially and in useful articles next month's issue will do that again. There will be told how Portland General Electric's street lighting laboratory for public officials is handled. A unique job of 440-volt series lighting at Moffatt Field will be described.

For engineers there will also be a picture story of the rebuilt Redondo steam plant; a graphic presentation of what Los Angeles city is doing to develop 40,000 kw. more from the drop along Owens Gorge on its water system; key maps for frequency allocations to be used by utilities, besides Western engineering and construction projects in pictures.

On the sales front line there will be a report on the big fall market in the Western Merchandise Mart which has rushed to completion a new addition as big again as the original building. The appliance floors blossom again with many new displays. In the Sales Guide will start a new series by Ken Hampton, targeted at the shift in conditions in the appliance industry now that surpluses begin to appear in some lines and credit regulations are withdrawn. The News Letter will again bring advance tidings of things to be expected.

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Cover photo: Installing capacitors on primary feeder, the Washington Water Power Co.

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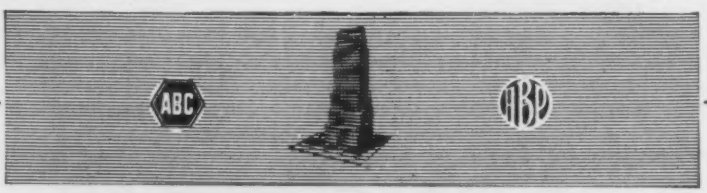

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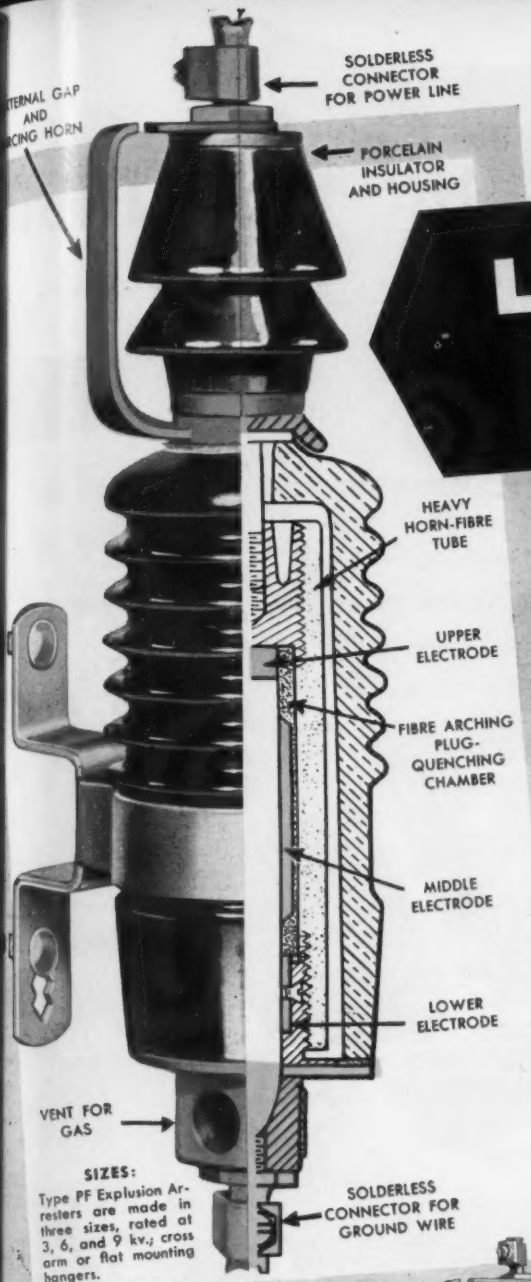
No strings TIED TO THIS

L-M Heavy Duty EXPULSION TYPE Lightning Arrester



SIZES: Type PF Explusion Arresters are made in three sizes, rated at 3, 6, and 9 kv.; cross arm or flat mounting hangers.

OK on heavy or light duty lines
on very high surge currents
especially for rural service
for long life
on trouble-free, dependable operation
on ease of installation

In the L-M Type PF Heavy-Duty Expulsion Type Distribution Arrester, the combination of a unique three-part gap and the exclusive L-M wedge-shaped arcing chamber provides for an exceptionally high degree of protection.

Surge capacity fully meets the proposed AIEE-NEMA surge test standard of 65,000 amperes on 5x10ms wave. Independent of surge current values, small or large follow currents are interrupted at the end of the first half-cycle, giving adequate protection to sectionalizing fuses. The shape and size of the arcing chamber results in prolonged service life.

The hanger and external gap arrangement give maximum bird protection. Hanger is insulated from both line and ground.

High Discharge Capacity provided by wedge-shaped arcing chamber.

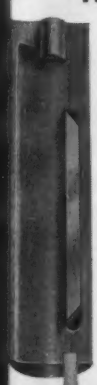
Fast Action: series of gaps cuts time lag in sparkover on steep wave fronts. Cuts follow current at end of first half-cycle.

Long Life: long arcing channel slows erosion of fibre; wedge shape switches arc off center electrode and minimizes burning; maintains low sparkover voltage.

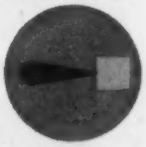
No radio interference.

Extremely low IR Drop.

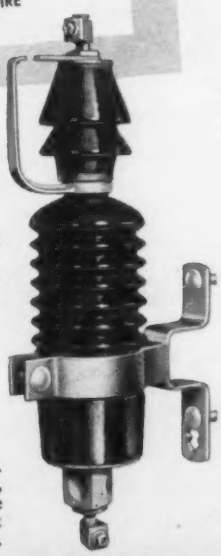
Fibre Arcing Chamber design shows L-M Superiority



LEFT: Inside of fibre arcing chamber: the three electrodes form two internal gaps, and provide excellent sparkover characteristics.



ABOVE: Cross section of chamber. Wedge presses arc into thin sheet, so even small follow currents are promptly extinguished. Wide part is ample space for venting the gases.



Valve Types, too!

L-M makes both valve and expulsion arresters. L-M Field Engineers will help you select the type that best meets your requirements. *Or write Line Material Company, Milwaukee 1, Wisconsin for bulletins and data on either or both types.*

LM

LINE MATERIAL
LIGHTNING ARRESTERS

L-M DISTRIBUTION EQUIPMENT INCLUDES: Distribution Transformers • Fuse Cutouts and Fuse Links • Lightning Arresters • Oil Switches • Pole Line Hardware • Line Construction Specialties • Underground Equipment • Pole Caps, etc. • Street and Airport Lighting Equipment • Wired Radio Control Equipment • Capacitors

NOW...in the coast's largest Electrical Manufacturing plant...

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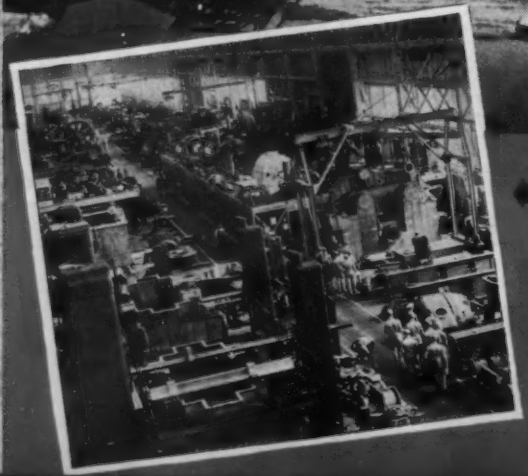
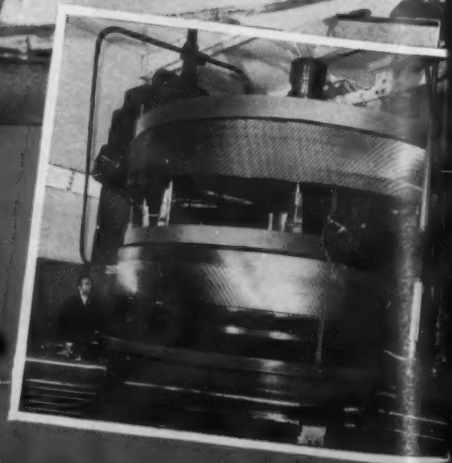


One of the main manufacturing aisles in the new Westinghouse plant at Sunnyvale, showing the machine tools for processing heavy equipment.



Typical of the specialized precision equipment at Sunnyvale is this giant hobber—here giving the finish cut to a 160-inch marine gear.

lectrical and Steam Equipment

made in the west for the west

Here's PRODUCTIVE POWER to match the West's rapidly expanding needs for electrical and steam equipment of many types!

In our new 57-acre plant at Sunnyvale, California, we have what we've long wanted—major facilities to manufacture *in the West* for western industry.

Sunnyvale's complement of tools and specialized equipment is the most diversified of any commercial plant in the West. It has the size and capacity to handle the largest and heaviest types of equipment—as well as a wide range of precision manufacturing jobs. Subcontract facilities for many types of heavy machine work are also available to western manufacturers.

Add to this our well-equipped manufacturing and repair facilities at Emeryville—and at Los Angeles, Portland, Seattle and Salt Lake City. Add the complete chain of Westinghouse sales offices, engineering offices, distributors and warehouses—stretching from Mexico to the Canadian border. The answer—manufacturing and service capacity for electrical and steam equipment worthy of the West's needs.

We like this idea of more equipment made *in* the West, *for* the West. We believe you'll like it, too—and find it helpful in many productive ways. J-90578

Now made in the West, for the West... by Westinghouse

Steam Turbines—for turbine-generator units in ratings up to 15,000 kw.

Motors and Control—for a wide range of industrial applications.

Marine Gears — up to 160 inches in diameter, for ship drives.

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Electric Water Heaters—popular members of our home appliance family.

Transformers—from small distribution types up to 5,000 kva power transformers.

Hydraulic Valves — and equipment for hydroelectric power plants, reclamation and irrigation.

Electric Home Heaters—that give clean, economical, easily regulated heating the year 'round.

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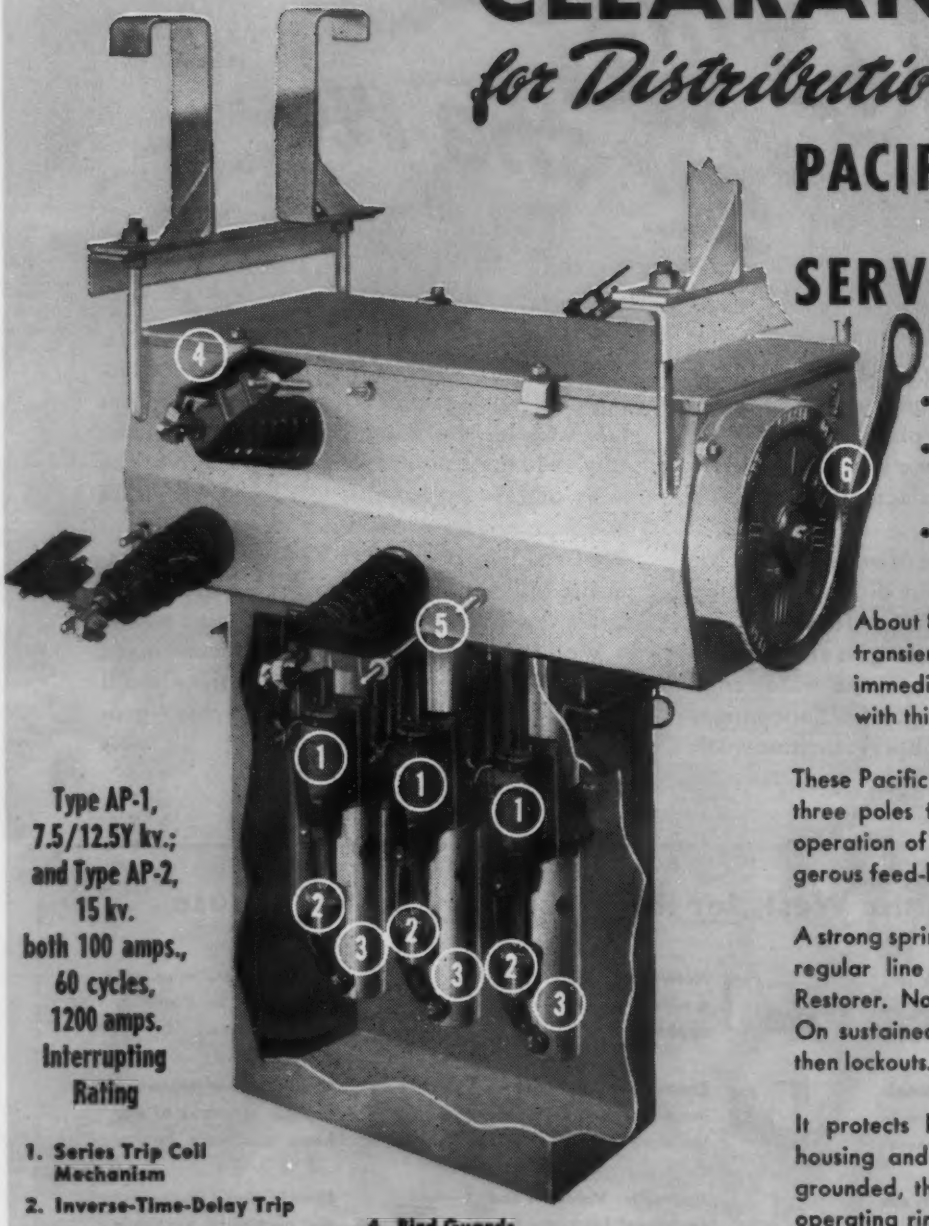
Westinghouse

PLANTS IN 25 CITIES... OFFICES EVERYWHERE

Here's 3-PHASE Rural FAULT CLEARANCE *for Distribution Lines*



PACIFIC ELECTRIC'S THREE POLE SERVICE RESTORER

Types AP-1 and AP-2

- Trips on Overcurrent
- Recloses Automatically up to 3 Times
- Operated by Manually-wound Spring

About 80% of blown fuses are caused by transient faults and these can be cleared immediately and service restored at once with this Automatic Service Restorer.

These Pacific Electric Service Restorers open all three poles together, preventing single-phase operation of three-phase equipment and dangerous feed-backs.

A strong spring, easily rewound by hand during regular line patroling, actuates the Service Restorer. No auxiliary power supply needed. On sustained faults, it recloses up to 3 times, then lockouts.

It protects linemen because the mechanism housing and the tank are dead and can be grounded, the spring winding handle and the operating ring are dead and there are no exposed hot parts excepting the terminals.

Type AP-1, 7.5/12.5Y kv.; and Type AP-2, 15 kv. both 100 amps., 60 cycles, 1200 amps. Interrupting Rating

1. Series Trip Coil Mechanism
2. Inverse-Time-Delay Trip
3. Expulsion Contacts Quench Arcs Immediately, Save Oil, Save Contact Burning
4. Bird Guards
5. Coordinating Gaps
6. Spring Winding Handle

Write for Bulletin No. 58.

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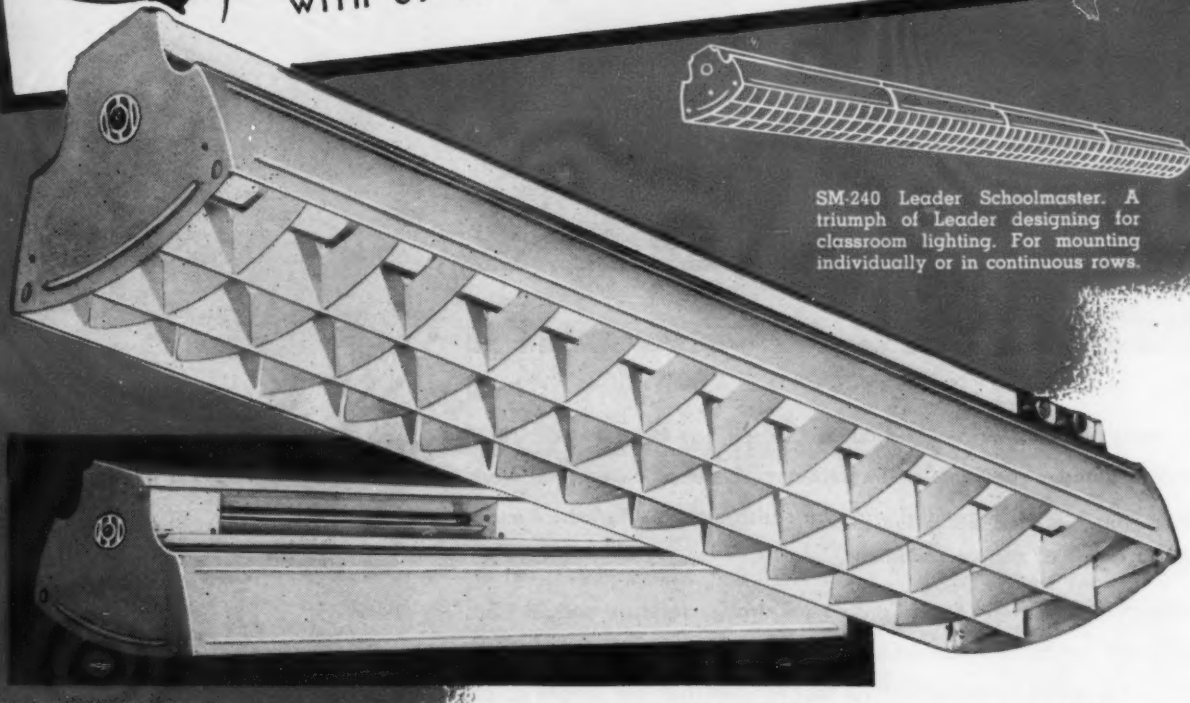
Leader announces the SCHOOLMASTER

with or without built-in germicidal lamp

SM-240 Leader Schoolmaster. A triumph of Leader designing for classroom lighting. For mounting individually or in continuous rows.



SMG-240 Leader Schoolmaster with optional built-in germicidal lamp — an intensified source of radiant ultraviolet energy that rapidly destroys air-borne bacteria.

It's New! It's Different! It's America's Finest Classroom Fixture!

Good schoolroom lighting is an important tool of learning. And the Leader SCHOOLMASTER has really "rung the bell." Here, at last, is a classroom fluorescent fixture with no glare, correct intensity and even distribution of light. And there's an optional feature of a built-in germicidal lamp that is not visible when the fixture is hung at ordinary lighting levels. Yes, the Leader SCHOOLMASTER has *everything* for proper schoolroom lighting.

Only better electrical wholesalers and contractors distribute and install Leader fluorescent fixtures.

LEADER ELECTRIC COMPANY

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IT'S EASY TO WORK WITH—

For many years Central Rigid Steel Conduit has been the choice of many architects, engineers and contractors. Because it's easy to work, install, and can be depended upon for satisfactory performance under a wide range of service conditions.

Although Central Rigid Steel Conduit has strong, standard weight walls that resist mechanical injuries, it is easy to bend with any ordinary hickey. It's made in convenient 10 foot lengths that are simple to cut and thread. Precision cut threads on conduit and couplings assure fast make-up and tight, safe joints. Because Central Conduit is connected by threaded couplings, the best protection against vibration is provided. There is a type of Central Rigid Steel Conduit correctly treated and coated to meet every need for electrical raceway service.

Central Rigid Steel Conduit is handled by a distributor near you. There may be times when he can't fill your order immediately. But keep in touch with him. You will find that he's a cooperative and dependable source of supply.

Every manufacturing step of Central Rigid Steel Conduit is under the close control of one integrated organization.

• SPANG-CHALFANT

Division of The National Supply Company
General Sales Office: Grant Bldg., Pittsburgh 30, Pa.
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For your rehabilitation program...

For strong connections, call GraybaR

The operating efficiency of an electrical distribution system is no greater than the strength and electrical efficiency of its joints. Via Graybar, you can get everything you need to "connect up" your lines so they'll *stay up*. We distribute all types, styles and sizes of straight-line splices, splice reducers, twist sleeves, dead ends, tap-off connectors, and splicing tools.

Our nation-wide warehousing system places the products of many manufacturers within your easy reach—from the Graybar house near you. For certain items, there's still a waiting list. But, if you plan with us now, we can set up delivery schedules which will facilitate your planning any pole-line project—and help assure its completion on time. You'll find your local Graybar Representative anxious to help you in all the ways he can. *Graybar Electric Company. Executive offices: Graybar Building, New York 17, N. Y.*

4767

Who's a Graybar Specialist?

Every Graybar Representative, of course, is an *electrical* specialist—with the intelligence, knowledge, and experience to make sound recommendations on everyday electrical applications. But even a superman couldn't be an expert on all the items we handle! That's why, at each of our 18 key houses, there are Graybar Specialists in *inside and outside electrical construction, lighting, power apparatus, signaling and communication.* These men have intensive experience in their respective fields and are competent to handle complex technical problems. The services of both your Graybar Representative and nearby Graybar Specialists are always available to you.

Everything for your Pole Lines via GraybaR

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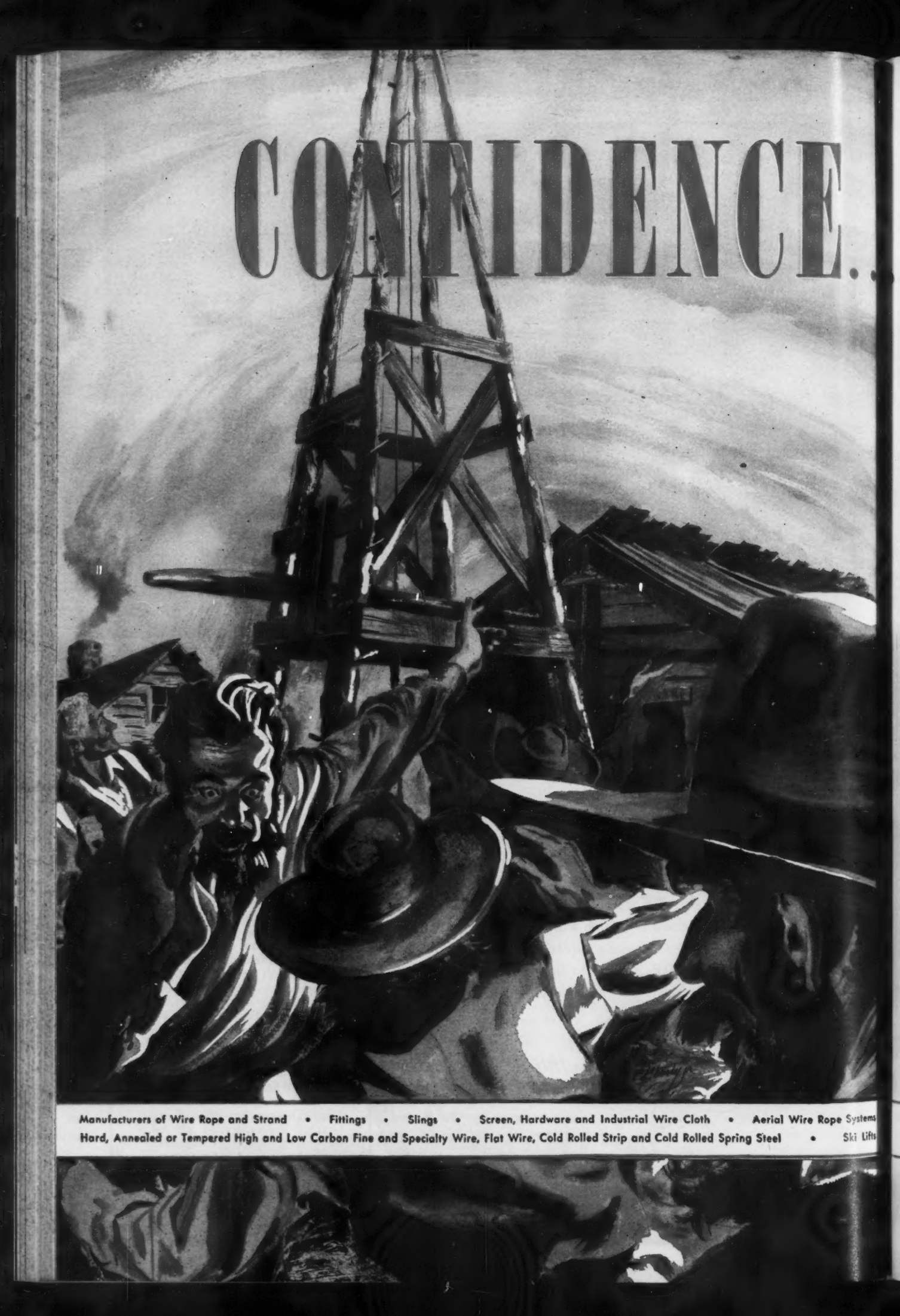

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Hard, Annealed or Tempered High and Low Carbon Fine and Specialty Wire, Flat Wire, Cold Rolled Strip and Cold Rolled Spring Steel • Ski Lifts

. . . . . how much is it worth?

EVEN IN THIS ATOMIC ERA, what engineer wouldn't be awed at the possibility of building a bridge of his own design across the hazardous Niagara gorge? Yet John A. Roebling was commissioned to do just that *98 years ago* . . . ten years before this country's first oil well was drilled!

What an outstanding example of confidence. The confidence of a man in his own work. The confidence of people in one man and his abilities.

Today this same confidence, that has been nurtured through the years, is still alive in the company founded by this man and his sons. On this same foundation was built a business that has always believed that confidence must be created and grows through completely honest business transactions with each and every one of its customers.

Little wonder, then, that your confidence in John A. Roebling's Sons Company is guarded so carefully.

ROEBLING PORTABLE POWER CABLES REWARD YOUR CONFIDENCE—CONSISTENTLY

THERE'S SATISFACTION—and profit—in specifying a product you're confident will deliver without question. That conviction is the main reason why electrical engineers and contractors turn so often to Roebling Portable Power Cables.

Two examples of these long-lasting, low-cost performers are Roeclad and Roecable . . . made for efficient, dependable service on shovels, dredges, mining machines, air compressors and other portable equipment. Roeclad is exceptionally resistant to abrasion, impact or crushing pressure, with adequate flexibility for normal use. Roecable, more flexible, has greater resistance to flexural fatigue plus good abrasion and impact qualities.

Both are cables that Roebling is proud to endorse . . . made of the same fine quality in design, in engineering, in dimensions. Let a Roebling Field Engineer help you select the one that's best for *your* service conditions. Call him at our nearest branch office.

JOHN A. ROEBLING'S SONS COMPANY
OF CALIFORNIA

San Francisco • Los Angeles • Seattle • Portland

Electrical Wire and Cable • Suspension Bridges and Cables
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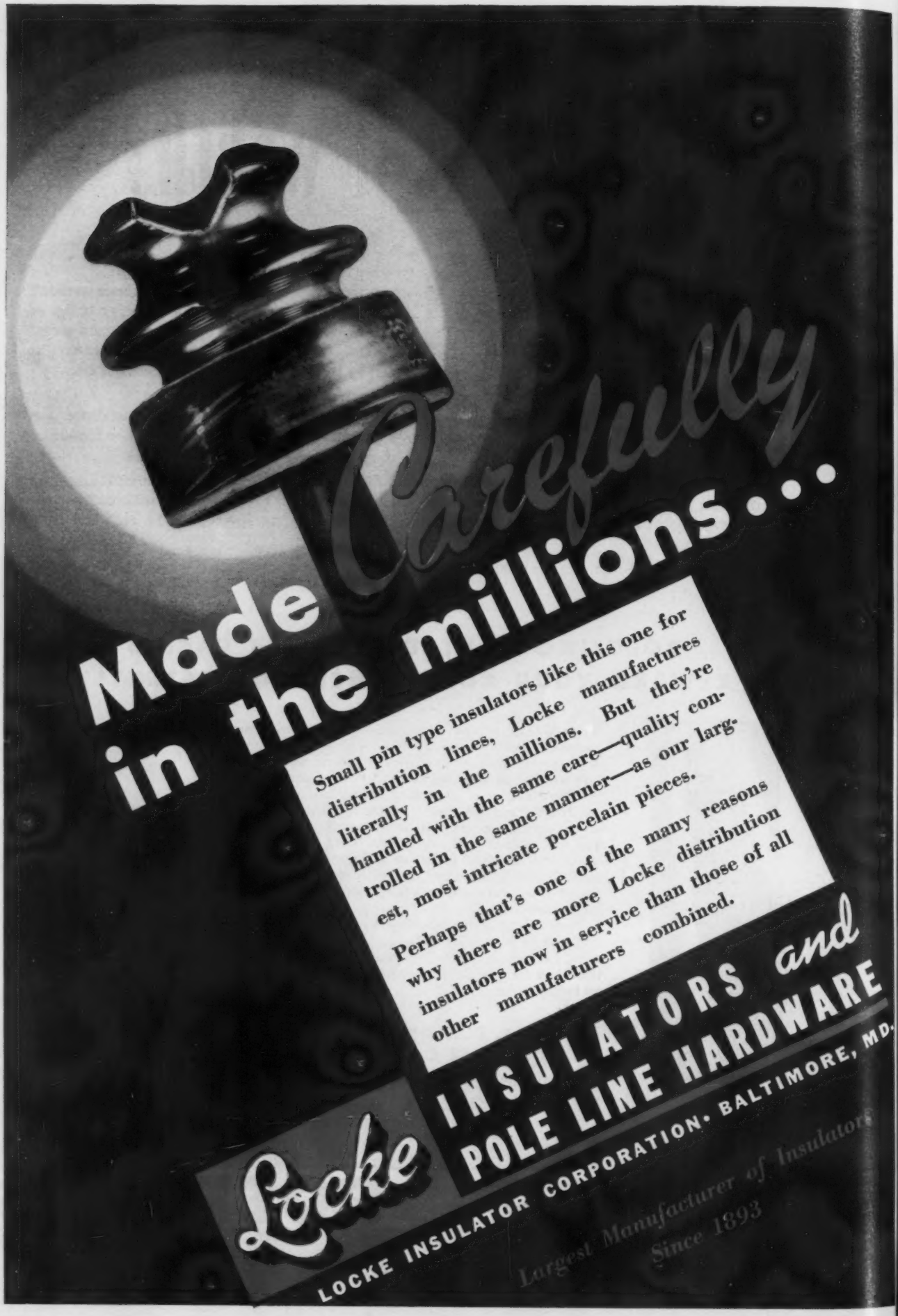
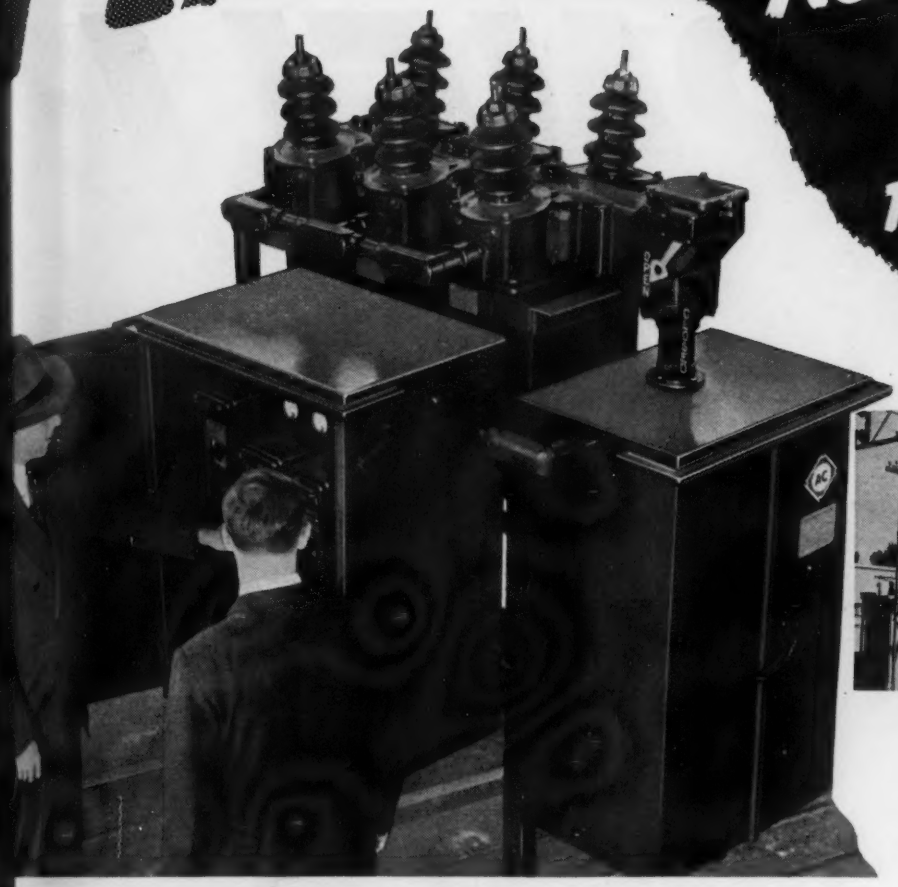
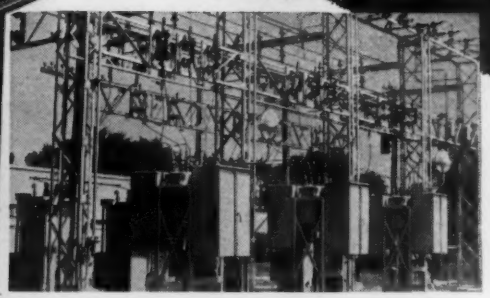
A CENTURY OF CONFIDENCE


Made Carefully in the millions...
Small pin type insulators like this one for distribution lines, Locke manufactures literally in the millions. But they're handled with the same care—quality controlled in the same manner—as our largest, most intricate porcelain pieces.
Perhaps that's one of the many reasons why there are more Locke distribution insulators now in service than those of all other manufacturers combined.
Locke INSULATORS and POLE LINE HARDWARE
LOCKE INSULATOR CORPORATION • BALTIMORE, MD.
Largest Manufacturer of Insulators
Since 1893

PLAN "Automatic, Fast Reclosing Breakers" FOR SYSTEM STABILITY!





"O" TYPE BREAKERS PROVED IN SERVICE

HERE, IN AN UNATTENDED SUBSTATION, A-C 7500-volt "O" type breakers are giving trouble-free, low maintenance automatic reclosing service and system protection.

Allis-Chalmers "O" Type Oil Breakers Improve System Stability by Clearing Transient Faults Fast . . . Automatic Reclosing Provides Low Maintenance, Low Cost System Protection for Unattended Substations!

HIGH SPEED circuit interruption plus fast reclosing means faults are cleared before system loses stability—maintains high customer satisfaction. Utility records show that over 80% of line faults are transient and outages may be avoided with high speed reclosing breakers.

Allis-Chalmers frame-mounted "O" type breakers offer *high speed* circuit interruption . . . *fast* reclosing . . . *low* maintenance operation. They are ideally suited for installation in unattended substations.

"O" TYPE BREAKERS IN WIDE RANGE OF RATINGS

From 7.5 to 23 kv, 600 and 1200 amperes, and interrupting capacity to 250,000 kva. Frame-mounted and weatherproof. On 50,000 kva rating, A-C's highly efficient *Expulsion Port interrupting devices are used. "O" type breakers of higher interrupting capacity are equipped with the *"Ruptor" interrupting devices. Both types greatly reduce contact burning, oil deterioration, and tank pressures . . . assure high speed arc extinction.

RUGGED MECHANISMS FOR POSITIVE OPERATION

These breakers employ reliable trip mechanisms and gravity-and-spring accelerated separation of contacts with two breaks per phase for positive, fast circuit interruption. Improved fast solenoid operator provides 30-cycle reclosing when desired for automatic service restoration.

Allis-Chalmers breakers liberally meet all ASA and NEMA standards. They are backed by nearly 50 years of circuit breaker design and manufacturing experience. For additional details on the "O" type or other types, call your nearby A-C office or write ALLIS-CHALMERS, MILWAUKEE 1, WIS.

*Allis-Chalmers Trademark A 2283

1847 1947 A CENTURY OF SERVICE to Industry THAT MADE America Great

COMPLETE BREAKER LINE—Power—2500 to 230,000 volts; Oil—from small indoor switchboard to large indoor and outdoor types; Indoor — 2500 to 34,500 volts, 15,000 to 1,500,000 kva; Outdoor — 7.5 kv up, 50,000 to 3,500,000 kva.

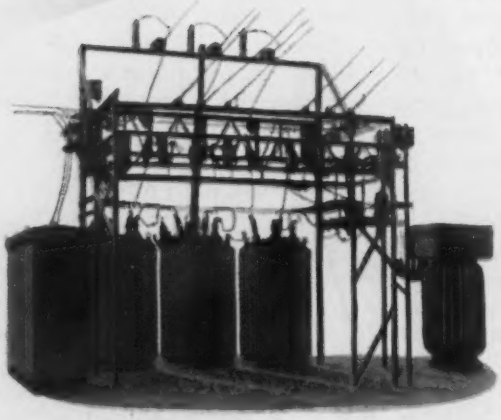
ALLIS-CHALMERS

One of the Big 3 in Electric Power Equipment — Biggest of All in Range of Industrial Products

Compare/ FIELD PROVEN

CORNELL-DUBILIER CAPACITORS

THE WORLD'S MOST *DEPENDABLE* CAPACITOR FOR POWER-FACTOR IMPROVEMENT

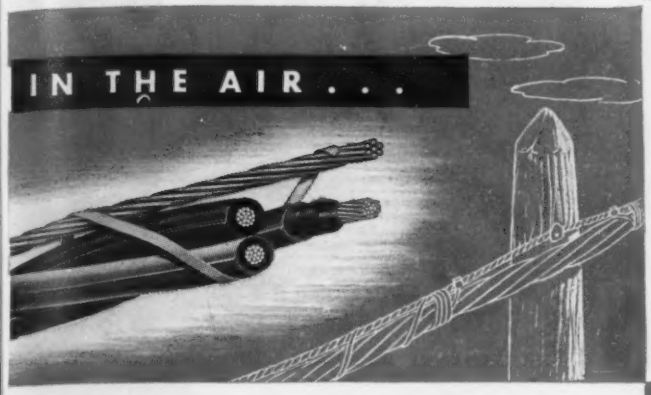


Direct comparison provides the fairest check on capacitor dependability. Cornell-Dubilier offers the service records of 3,000 installations, some in operation for more than ten years, as evidence of C-D Capacitor dependability. No need to rely on laboratory tests when you can examine plentiful field-test evidence . . . convincing proof of Cornell-Dubilier's unparalleled performance under punishing operating conditions. When in need of capacitors, specify completely dependable Cornell-Dubilier's. Write Cornell-Dubilier Electric Corporation, Dept. C8, South Plainfield, New Jersey. Other plants in New Bedford, Worcester and Brookline, Massachusetts, and Providence, Rhode Island.

FOLLOW THE LEADERS • ***DEMAND DEPENDABLE C-D CAPACITORS FOR YOUR SYSTEM***

CORNELL-DUBILIER • ***WORLD'S LARGEST MANUFACTURER OF CAPACITORS***

QUESTION: Which cable is best for any given service?



OKOLITE-OKOPRENE SELF-SUPPORTING AERIAL CABLES

Aerial cable construction with in-built Copperweld or galvanized steel messenger. Eliminates separate stringing of messenger and cable and placing of rings. Reduces tree trimming. Saves space in congested areas.

OKONITE-OKOPRENE CONTROL CABLES

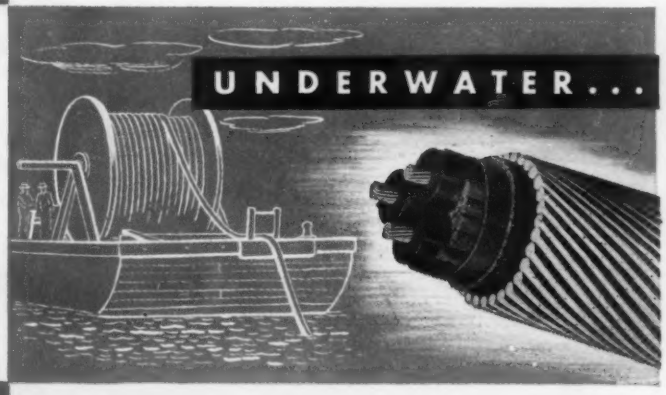
Combine the original 30% (by weight) mineral base rubber insulation with covering of Okonite-developed neoprene compound. No braids to rot. Resists moisture, ozone, oil, chemicals and flame. Eliminates surface discharge.

OKONITE-CALLENDER PAPER INSULATED POWER CABLES

They include cables for Oilostatic Transmission Systems (Voltage: up to 230,000 v.) . . . Oil Filled Cables (Voltage: up to 230,000 v.) . . . Solid Type Cables (Voltage: up to 75,000 v.) . . . and gas pressure cables at various voltages depending on gas pressure.

OKOLITE NON-LEADED SUBMARINE CABLE

Moisture-resistant Okolite insulation on conductors also resists heat and ozone, eliminates the need for lead sheathing—an important saving in weight and cost. A tough steel wire armor, helically wound over a cushion of saturated jute protects against mechanical damage. Voltage: up to 35,000 v.



HEADQUARTERS FOR ANSWERS

OKONITE SINCE 1878

OKONITE

No one cable is good for every application. But Okonite research has established what types of cables are best for differing conditions. Your Okonite representative is prepared to work out with you the best solution for cable problems. The Okonite Company, Passaic, New Jersey.

5138

On its 50th

The Armored Cable Industry

PRESENTS

THE IMPROVED

Bonded

ARMORED CABLE

The new 1947 Code, Type AC Armored Cable, sizes 14 and 12 AWG is smaller in size, lighter in weight, and embodies a bond wire under and in contact with the armor for maximum safety.

Member Companies of Armored Cable Section of

American Flexible Conduit Co.
American Metal Moulding Co.
Clifton Conduit Co., Inc.
Columbia Cable & Electric Corp.
Crescent Insulated Wire & Cable Co., Inc.
Eastern Tube & Tool Co., Inc.

ANNIVERSARY

Armored Cable has Provided 50 Years of Safe, Low Cost Wiring

In 1897 the first armored cable was installed. It was the first self-contained wiring system of raceway and conductor combined in one assembly.

Listed by Underwriters' Laboratories in 1899 and recognized in the National Electrical Code of that year, it has provided a safe, low-cost system of electrical wiring for 50 years.

In the last twenty years alone, over SIX BILLION FEET of armored cable have been installed.

The New Bonding Feature

A flattened tinned copper or aluminum wire continuous throughout the length of the cable makes contact with the convolutions of the steel protective armor. This construction assures a permanently low armor resistance for maximum safety.

Code Permits Smaller Size, Lighter Weight, in New Bonded Cable

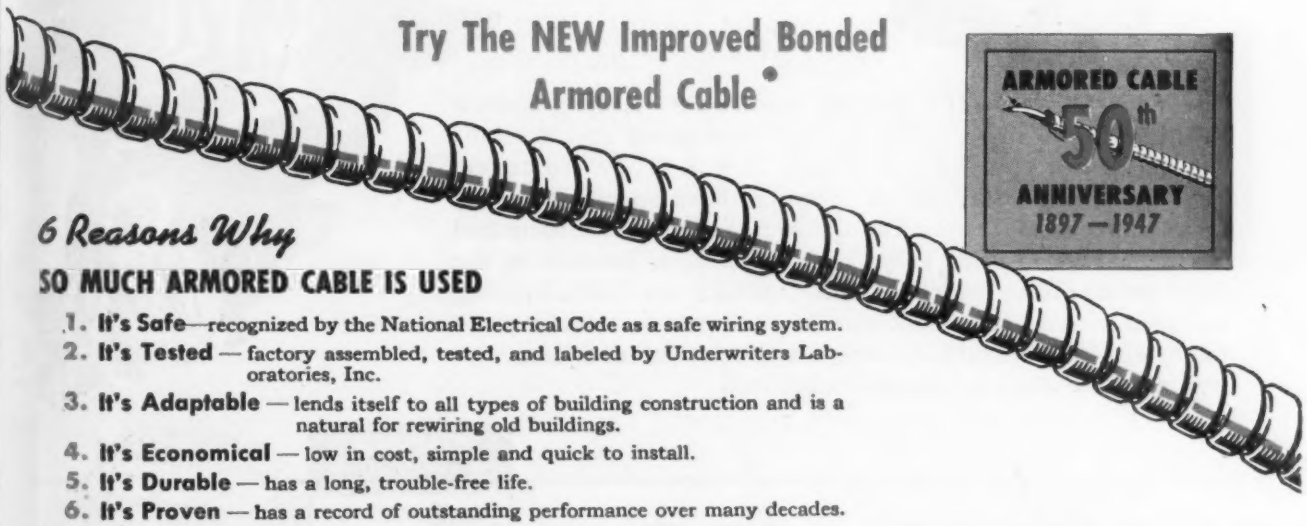
The 1947 Code sizes 14 and 12 AWG type AC armored cable will employ small diameter insulated conductors. These cables are smaller in size and lighter in weight than any previously permitted, with consequent advantages in installation.

Ready-to-Use When You Get It

Armored Cable provides the only general purpose, factory assembled, factory tested, metal-protected wiring system. It's ready-to-use when you get it.

From bare conductor to finished wiring system, the entire process is factory controlled. Its manufacture is subject to all the care and precision that modern industry commands — your guarantee that it is ready for safe operation and a long trouble-free life.

Try The NEW Improved Bonded Armored Cable*



ARMORED CABLE 50th ANNIVERSARY 1897—1947

6 Reasons Why

SO MUCH ARMORED CABLE IS USED

1. **It's Safe**—recognized by the National Electrical Code as a safe wiring system.
2. **It's Tested** — factory assembled, tested, and labeled by Underwriters Laboratories, Inc.
3. **It's Adaptable** — lends itself to all types of building construction and is a natural for rewiring old buildings.
4. **It's Economical** — low in cost, simple and quick to install.
5. **It's Durable** — has a long, trouble-free life.
6. **It's Proven** — has a record of outstanding performance over many decades.

National Electrical Manufacturers Association

General Electric Company
Northern Electric Company, Ltd.
The Okonite Company
Paranite Wire & Cable Corp., Div. of Essex Wire Corp.
Triangle Conduit & Cable Co., Inc.
Walco Industries Inc. of Philadelphia

Certified FLEUR·O·LIERS...

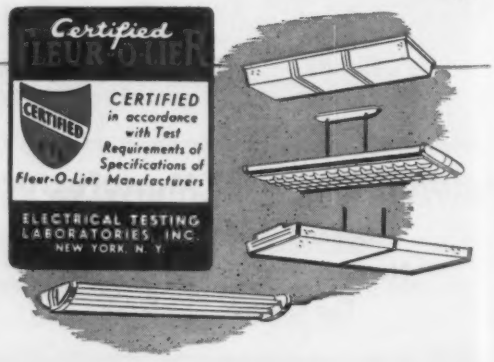
the name that set new high standards for FLUORESCENT LIGHTING FIXTURES

Certified FLEUR-O-LIER fixtures, made by 27 leading fluorescent lighting fixture makers, are built to exacting specifications for performance, construction and service. They are tested, checked and CERTIFIED as meeting those specifications by famous Electrical Testing Laboratories, Inc. and are identified by the FLEUR-O-LIER Label on every fixture. Because of the high standards to which FLEUR-O-LIERS are built, lighting companies and lamp manufacturers endorse and recommend them. FLEUR-O-LIERS deserve the support of everyone who wants to see such standards maintained.

FLEUR·O·LIER

Manufacturers

Fleur-O-Lier is not the name of an individual manufacturer, but a group of 27 leading fixture manufacturers. Participation in the FLEUR-O-LIER MANUFACTURERS' program is open to any manufacturer who complies with FLEUR-O-LIER requirements.



... and to my grandson Wilmer, instructions to change oil in my transformers in 1997

Did YOU know about this transformer oil with an estimated 50-year life?

Oxidation is bad news for transformer oil. It causes impurities to form in the oil. Then these contaminants interfere with the functioning of the transformer cooling system...and damage linen and cotton insulating fabrics.

Up until recently, there hasn't been much you could do about this oxidation problem except to change oil frequently —an expensive precaution. But Shell has changed all that. Shell has perfected a revolutionary transformer oil known as Shell Diala Oil 15. That's *good* news.

Tests prove that Diala Oil 15 resists oxidation 140 times longer than the next best transformer oil. So unprecedented is its oxidation resistance that—judging by accelerated tests—*Diala 15 can last 50 years in a transformer.*

Diala 15 also has excellent thermal transfer properties and insulating value ...low pour point...minimum volatility.

When it's time to change—change to Shell Diala Oil 15. You'll be money ahead.

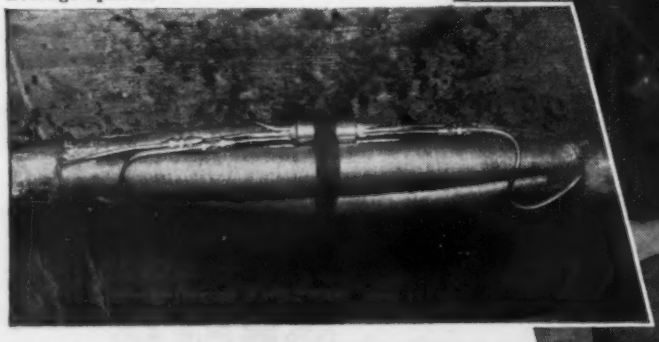
SHELL DIALA OIL 15

SHELL®

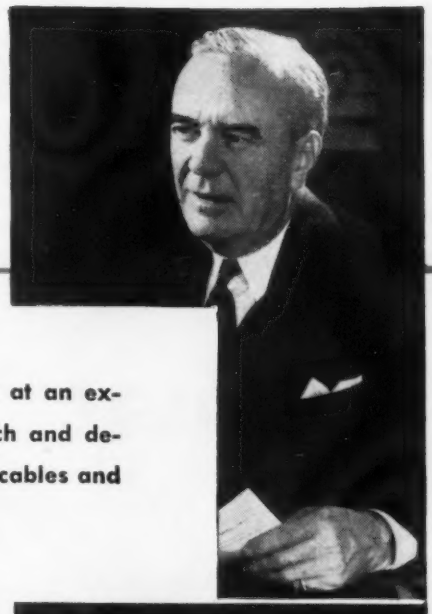
What makes the cost of an

Termination of PC Pressure Compensated Cable in a pothead. Note simple connection for pressure tubes.

Splicing is easy with only three extra tube connections which can be made by the average splicer.



electrical cable low?



A CHIEF ENGINEER TELLS US:

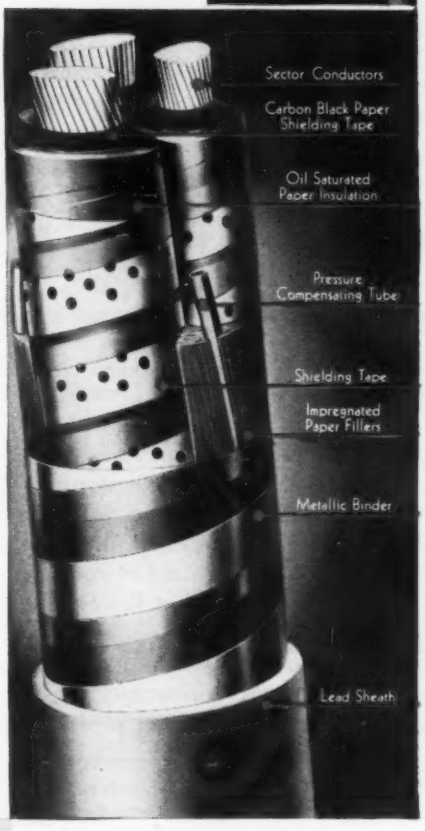
"Our real savings come not from an individual purchase at an extremely low price but from the results of industry research and development which enable us to increase the ratings of our cables and thus reduce the entire capitalization per unit of capacity."

THE chief engineer who wrote the above letter was talking about paper insulated cable—and he expresses our thoughts exactly.

American Steel & Wire Company has been an outstanding producer of Paper Insulated Cable of both solid and "gas pressure compensated" types. Our facilities are modern and our research has been intensive in developing better cable such as the PC Pressure Compensated Cable. This cable increases the current carrying capacity by keeping the internal pressure stabilized within prescribed limits. This is accomplished by the inclusion of small, perforated gas-filled, lead tubes in the cable assembly. The heat of the cable forces the cable saturant into the small holes forming hundreds of small gas cushions which absorb any excess pressure and prevent damage to the lead sheath.

When the PC Cable cools, the oil saturant contracts. The compressed gas in the tubes forces the oil back into the cable thus preventing the wide swings from pressure to vacuum that are encountered in ordinary cable.

These benefits are obtained in PC Cable with no radical change in basic construction. Installation is not difficult and maintenance costs are greatly reduced.



AMERICAN STEEL & WIRE COMPANY

Cleveland, Chicago and New York

Columbia Steel Company, San Francisco, *Pacific Coast Distributors*
Tennessee Coal, Iron & Railroad Company, Birmingham, *Southern Distributors*
United States Steel Export Company, New York

UNITED STATES STEEL

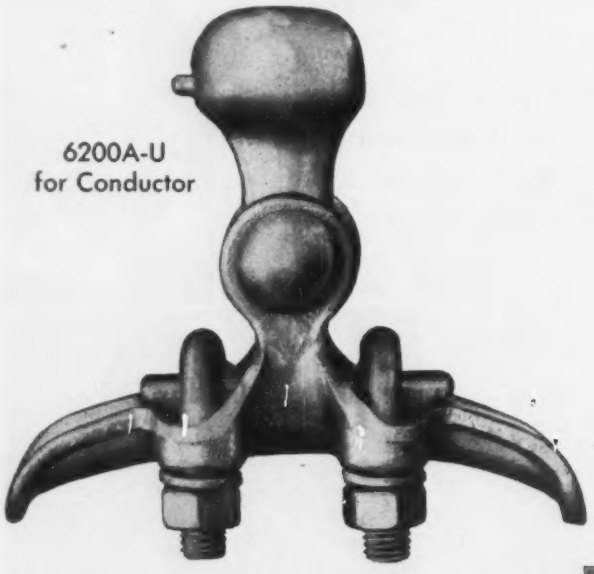
ADVANTAGES OF PC PRESSURE COMPENSATED CABLE

1. Insulation maintained thoroughly saturated with compound at all times.
2. Internal pressure is stabilized within prescribed limits.
3. Controlled sheath stresses. There is no repeated expansion and contraction, no fatigue or splitting of lead.
4. Pressure along cable line is uniform, not variable from joint to center of section to joint.
5. Interchangeability. Cable can be spliced to existing solid type cable without difficulty.
6. Increased current carrying capacity. Many present-day limits are based on allowable sheath stress—type PC Cable controls these stresses.
7. Improvement in operating voltage stress is possible, since ionization and gas inclusions are eliminated.
8. Reduced over-all transmission cost per KVA mile.
9. Continuous sheath supervision.

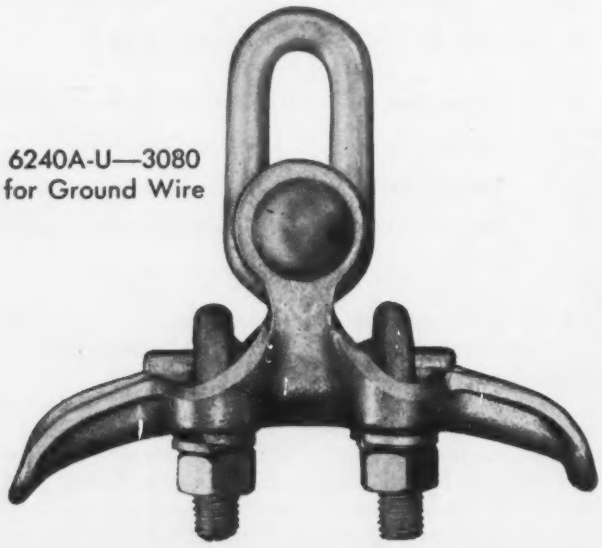
AMERICAN STEEL & WIRE COMPANY
USS
AMERICAN ELECTRICAL WIRE AND CABLE
UNITED STATES STEEL

U·S·S Paper Insulated Cables

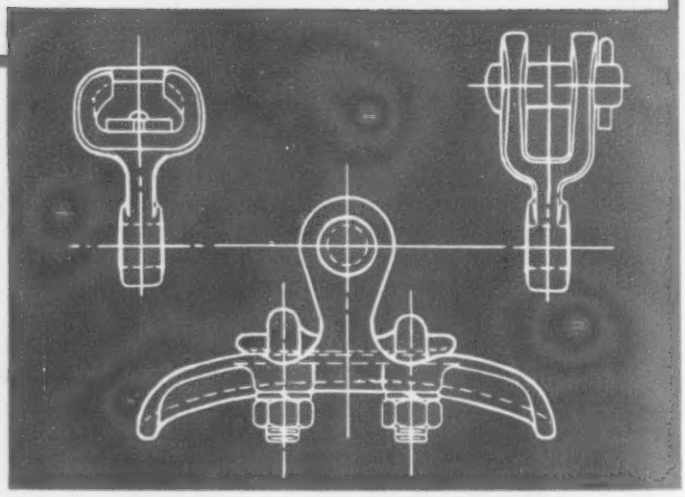
New BTC Forged Steel Suspension Clamps with Design Improvements



6200A-U
for Conductor



6240A-U—3080
for Ground Wire



New Series 6200A Forged Steel Suspension Clamps for all Conductors and Ground Wires, except the Hollow Copper Types.

In the interest of improved field performance, the smaller bore sizes of the popular Series 6200 clamps are being redesigned.

Lighter weight, shorter Clamp Body, improved Clamp-Body-Seat and Keeper contours, and maximum clamping pressure at Keeper center are factors in preventing possible cable-vibration damage. Greater Vertical-Line-Angle accommodation. Socket and new clevis connectors are forged steel. Absence of corona-inducing sharp edges.

Cable Sizes	Catalog Numbers — Type of Connector			Body Length	Ultimate Strength Pounds
	Socket	Clevis	None		
.125" to .46"	6200A	6230A	6240A	6½"	15,000
.312" to .60"	6201A	6231A	6241A	6½"	17,000
.187" to .60"	*6251A	*6261A	*6271A	6½"	17,000
.50" to .70"	6202A	6232A	6242A	7¼"	18,000
.50" to .82"	6203A	6233A	6243A	7¼"	18,000
.625" to 1.00"	6204A	6234A	6244A	8"	25,000
.625" to 1.15"	6205A	6235A	6245A	8"	25,000

*Reversible Two-Groove Keeper for greater Cable Size Range.

Specify J or U Bolts by suffix "J" or "U" to catalog number. Specify Copper or Aluminum liners when required.

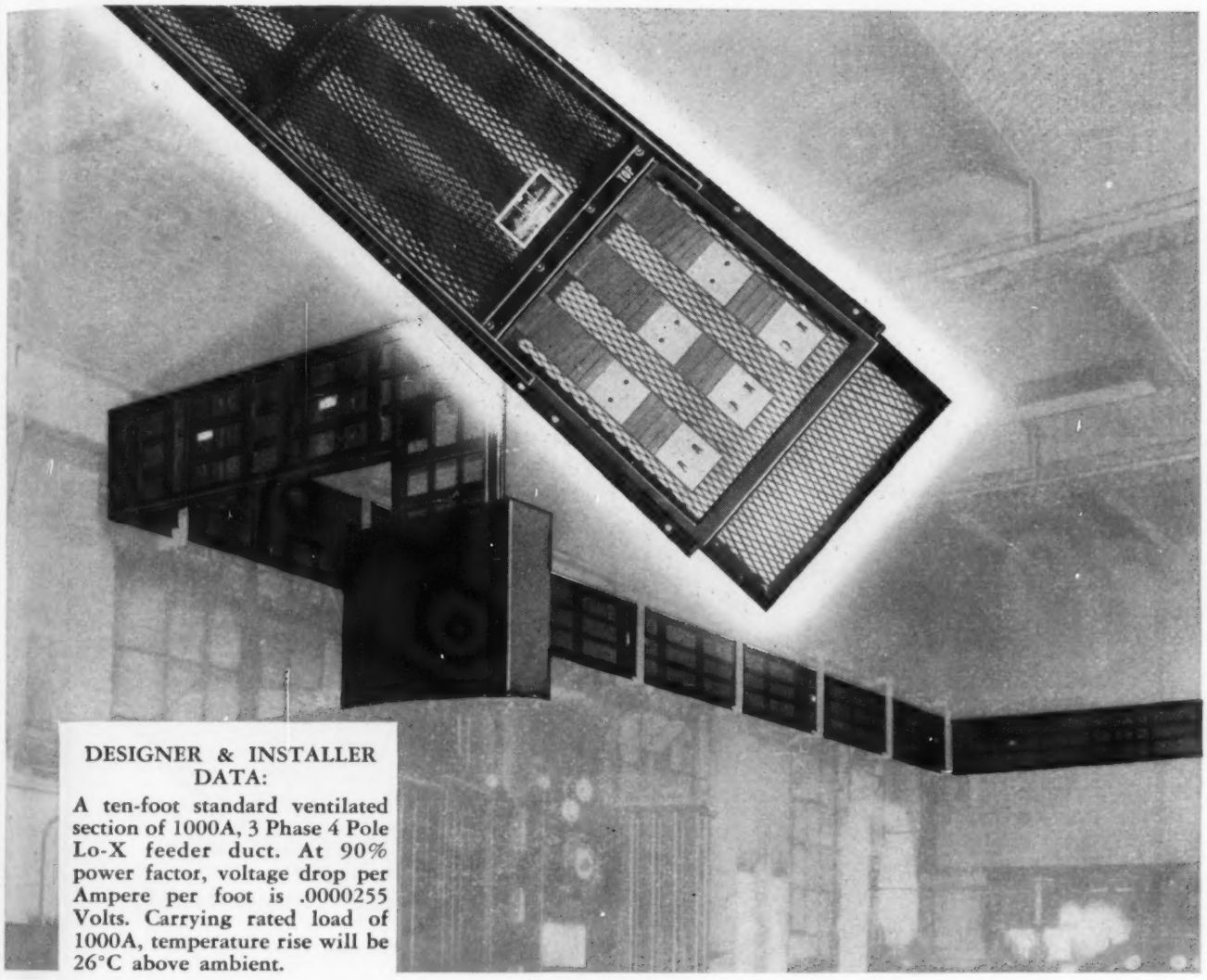
A postcard puts your name on our mailing list for data sheets.

Sold only through your insulator manufacturer

THE BREWER-TITCHENER CORPORATION, CORTLAND, N. Y.

Get the drop on voltage drop

with BullDog Lo-X BUStribution DUCT



DESIGNER & INSTALLER DATA:

A ten-foot standard ventilated section of 1000A, 3 Phase 4 Pole Lo-X feeder duct. At 90% power factor, voltage drop per Ampere per foot is .0000255 Volts. Carrying rated load of 1000A, temperature rise will be 26°C above ambient.

VOLTAGE drop can be figured—and so can temperature rise—even before your feeder system is installed.

The answer to these critical power distribution problems lies in BullDog Ventilated Lo-X BUStribution DUCT. And what do these problems mean to you? Just this:

1. Underpowered equipment can't operate efficiently. At ten percent under voltage, induction motors have *19%* less maximum running torque. And incandescent lights yield *30%* less illumination!

2. High temperatures shorten the life of your distribution system and needlessly increase electrical costs.

What to do about it:

Be sure that your operating voltages and temperatures are curbed to insure peak performance by specifying BullDog Ventilated Lo-X BUStribution DUCT. Unique, superior design minimizes voltage drop and temperature rise. Prefabrication makes it possible to predetermine both factors.

Call a BullDog Field Engineer for full information. Or, write BullDog direct for descriptive literature.

• • •

BullDog manufactures Vacu-Break Safety Switches—SafToFuse Panelboards—Superba and Rocker Type Lighting Panels—Switchboards—Circuit Master Breakers—"Lo-X" Feeder BUStribution DUCT—"Plug-in" Type BUStribution DUCT—Universal Trol-E-Duct for flexible lighting—Industrial Trol-E-Duct for portable tools, cranes, hoists.

Detroit 32, Mich. Field Offices In All Principal Cities. In Canada: BullDog Electric Products of Canada, Limited, Toronto

ADEQUATE WIRING SERVES AND SAVES

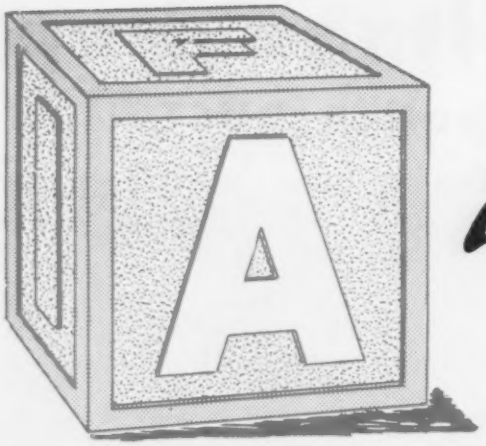
BULLDOG
ELECTRIC PRODUCTS COMPANY

CONSULT THE FOLLOWING PACIFIC COAST REPRESENTATIVES:

Coast Electric & Manufacturing Co.
1720 N. E. Sixth Avenue Tel. Garfield 2844
Portland, Oregon

Safety Switchboard Company
1445 Stevenson St. Tel. Hemlock 2470
San Francisco, Calif.

Mullenbach Electrical Manufacturing Co.
2300 East 27th Street Tel. Jefferson 2224
Los Angeles, Calif.



is for ANHYDROPRENE

the up-to-date product designed to replace braided, taped, and other fibrous-covered cables. **A** is for its many and varied applications and **A**, too, represents its money-saving advantages.

Featuring the exclusive ANHYDREX insulation and a tough neoprene jacket, Anhydroprene wires can be your assurance of dependable, unfailing service at less cost per hour of operation. Ask the Simplex representative in your area, or write us direct, for full details.

APPLICATIONS...

- Plant and shop wiring
- Control circuits
- Underground primaries
- Transformer leads
- Pole line risers
- Instrument wiring
- Mine service

ADVANTAGES....

- Light weight
- Small diameter
- No braids to rot
- High moisture resistance
- Resists oil, alkali, sunlight and flame
- Resists acids and corrosive chemicals
- Easily pulled into ducts
- Flexible at low temperatures
- Easy to splice
- No potheads required

SIMPLEX

WIRES & CABLES

SIMPLEX WIRE & CABLE CO., 79 SIDNEY ST., CAMBRIDGE 39, MASS.

that insure good performance

The spangled galvanized coating that protects Oliver Pole Line Hardware is very important to you—for its long life and complete coverage means lower maintenance and replacement costs for users of Oliver Products.

We have made galvanizing the object of continuous study and research, and when you specify items in the complete line of Oliver Pole Line Materials, you get the benefit of this highly improved protective coating.

OLIVER
IRON AND STEEL
CORPORATION
South Tenth and Muriel Sts.
Pittsburgh 3, Pa.

CERTIFIED STARTERS

. . . for better fluorescent lighting performance

. . . for economy in maintenance

In large factories—as well as large offices and stores . . . wherever fluorescent lighting is a major factor, CERTIFIED STARTERS can help ease maintenance problems, help assure top lighting performance from lamps. • Certified Starter Manufacturers build their products to rigid specifications. Famous Electrical Testing Laboratories, Inc. test, check and recheck those products . . . CERTIFY them as fully meeting the specifications. It's a positive means of assuring the user of high quality starters—protection and economy. Insist on the "ETL CERTIFIED" shield on the starters you sell or use!

Makers of CERTIFIED FLEUR-O-LIER fixtures and RLM Standards Institute fixtures have solved their starter problems by writing CERTIFIED STARTERS into their specifications.

Address inquiries to any of the following manufacturers of

Certified Starters

The Arrow-Hart and Hegeman Co., Hartford, Connecticut
The Bryant Electric Co., Bridgeport, Connecticut
Dura Electric Lamp Co., Newark, N. J.
General Electric Co., Bridgeport, Connecticut
Harvey Hubbell, Inc., Bridgeport, Connecticut
Instant Glow Starter Corporation, New York, N. Y.
Kuthe Laboratories, Inc., Newark, N. J.
The Lloyd Products Co., Providence, R. I.
Pass & Seymour Co., Syracuse, N. Y.
Sheldon Electric Co., Irvington, N. J.

FOR TWO-WAY UNDERGROUND PROTECTION

SPECIFY RoMarine - RoPrene

1. RoMarine insulation for moisture resistance and long life...
2. RoPrene (Neoprene) jacket and Neoprene fillers for resistance to soil acids and alkalies.

No. 6 AWG-3 Conductor RoMarine - RoPrene for 600 Volt Service.

RoMarine is a Performance type compound conforming to ASTM Specification D755, plus additional moisture resistance requirements. By tests it shows remarkable electrical stability in water and has long aging characteristics.

RoPrene is a tough Neoprene jacket with physical characteristics complying with ASTM Specification D752. Here, then, is *two-way protection,* with long life assured by the inherent resistance of Neoprene to oils, soil acids, alkalies, as well as, sun-checking and other weather hazards when installed aerially.

Now available in single and multiple conductor constructions, RoMarine-RoPrene is highly recommended for your underground services. Standard sizes in 2, 3, and 4 conductor cables run from 14 through 2 AWG. Single conductor cables are standard in sizes 14 through 4/0 AWG. With the exception of 2 conductor, which is furnished as a flat twin construction, all multiple conductor sizes are of round construction with Neoprene fillers. Conductors are clearly marked for polarity. Designed for 600-volt service RoMarine-RoPrene is recommended for operating temperatures up to 60° C.

The wide acceptance of RoMarine-RoPrene is indicative of its suitability for duct or direct earth, as well as, aerial installation . . . as an ideal substitute for more expensive, hard-to-get lead sheathed cable.

FROM BAR TO FINISHED WIRE

ROME CABLE CORPORATION

ROME • NEW YORK

Pacific Coast Agents
PACIFIC ELECTRO SALES, INC.

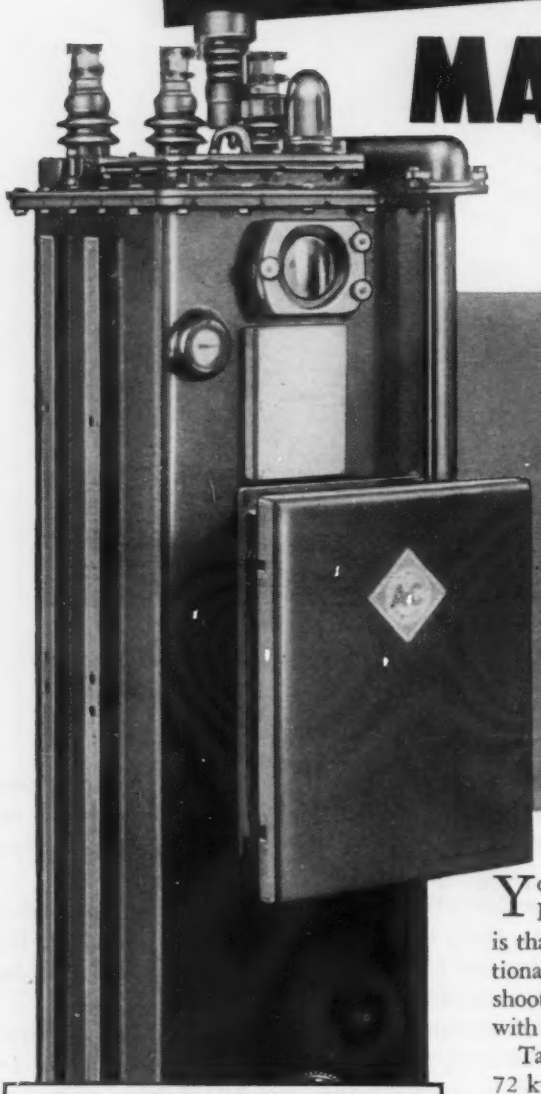
LOS ANGELES 13, CALIF. 340 Azusa Street

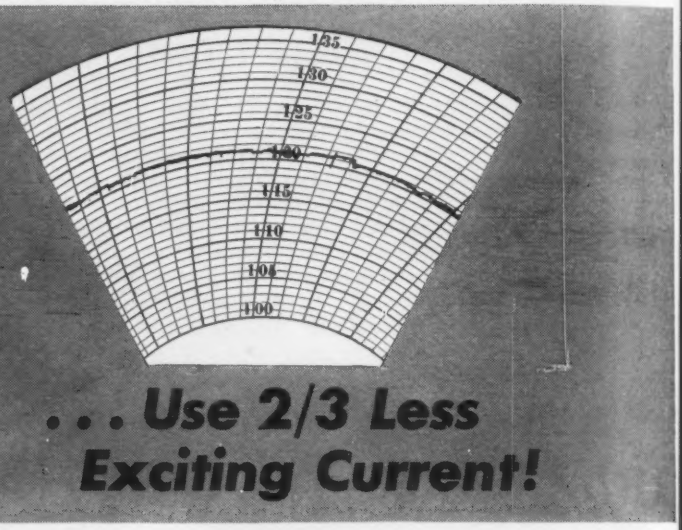
SAN FRANCISCO 3, CALIF. 1045 Bryant Street

SEATTLE 4, WASH. 1054 Fourth Ave., So.

ALLIS-CHALMERS *DFR REGULATORS

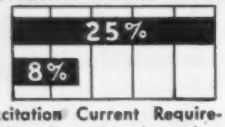
MAINTAIN ± 1 VOLT BAND WIDTH





. . . Use 2/3 Less Exciting Current!

EXCITING CURRENT TELLS STORY



% Excitation Current Requirements based on Regulator kva

The only complete line of ⅛% Step Regulators

DFR—Standard sizes for single phase regulation up to 6,900 v 250 kva.

AFR—Standard sizes for three phase regulation up to 69 kv, 750 kva.

YOU GET CLOSE CONTROL with the Allis-Chalmers DFR Feeder Voltage Regulator—band widths of ±1 volt. One reason for this close control is that the DFR Regulator is unhindered by the limitations of the conventional voltage control relay, or the need for a motor brake to prevent overshooting. And you get this close control, without burdening your system with expensive wattless current.

Take the case of a Power Company that buys 10 old type regulators rated 72 kva, 2,400 volts. Each Regulator requires 25% excitation—a total of 180 kilovars. Only 57 kilovars excitation would be required by 10 DFR Regulators of the same rating. That means savings to that Power Company of $1220 by use of DFR Regulators—based on an installed cost of $10 per kva for capacitors needed to balance the 122 excess kilovars.

Yes, Allis-Chalmers made a radical departure from accepted principles of regulation in 1933 when it introduced the step type regulator. But 14 years of trouble-free operation—4,000,000 kva under step regulation—have proved the principle sound, the design sturdy and dependable. The step regulator is an example of Allis-Chalmers 50 years of continuing effort to serve the power companies better—its 100 years of service to industry. For further details call your nearby Allis-Chalmers office, or write ALLIS-CHALMERS, MILWAUKEE 1, WIS. A 2279

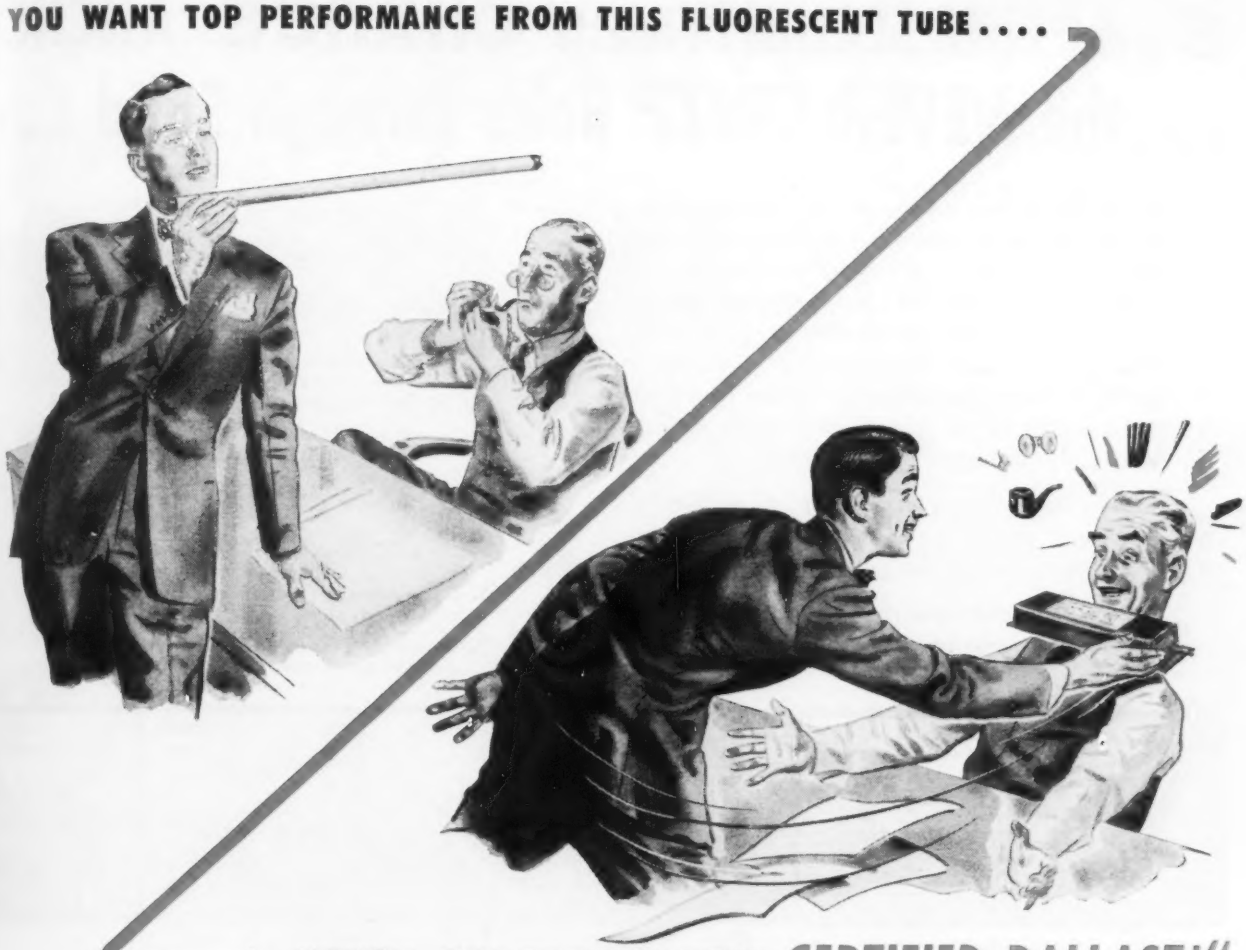
***DFR**—the only station type step regulator you can buy for single phase duty.

ALLIS·CHALMERS

One of the Big 3 in Electric Power Equipment — Biggest of All in Range of Industrial Products

1847 1947 A CENTURY OF SERVICE to Industry THAT MADE America Great

"IF YOU WANT TOP PERFORMANCE FROM THIS FLUORESCENT TUBE....

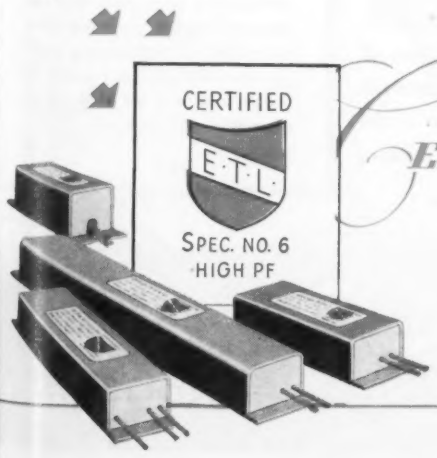


YOU'LL GET IT WITH THIS CERTIFIED BALLAST!"

The word "CERTIFIED" on a fluorescent lamp ballast tells you instantly that here is a product that gives you the greatest possible efficiency in operation and performance of fluorescent lighting.

Leading ballast makers and lighting engineers put together a set of exacting specifications that assure quiet operation, proper ballast temperatures, most light and longer life from fluorescent lamps. Famous Electrical Testing Laboratories, Inc. test, check and re-check CERTIFIED BALLASTS against these specifications . . . give it the ETL mark of approval. Insist on CERTIFIED BALLASTS in the fluorescent lighting equipment you sell . . . give your customers the protection they need and want.

CERTIFIED FLEUR-O-LIER MANUFACTURERS, RLM STANDARDS INSTITUTE and CERTIFIED LAMP MAKERS have solved their ballast problems by writing CERTIFIED BALLASTS into their specifications.



CERTIFIED BALLAST MANUFACTURERS

Makers of Certified Ballasts for Fluorescent Lighting Fixtures

Acme Electric Corporation
Cuba, New York

Chicago Transformer Div.
Essex Wire Corporation
3501 Addison St., Chicago, Illinois

General Electric Co.
Specialty Transformer Division
Fort Wayne, Ind.

Jefferson Electric Co.
Bellwood, Illinois

Sola Electric Co.
2525 Clybourn Avenue
Chicago 14, Illinois

Starring and Company
Bridgeport, Conn.

Wheeler Insulated Wire Co., 378 Washington Ave., Bridgeport, Conn.

Build LINE SECURITY *with* CHANCE ANCHORS ...the *NEVER-CREEP* Bolts through Solid Earth

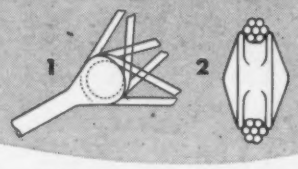
Chance Never-Creep Anchors offer the greatest possible line security under normal guying conditions because they are not dependent on the tamping of filled-in earth for their holding power. They pull entirely against solid, undisturbed earth. They are not subject to serious loss of holding power due to moisture seepage. Tests, over a period of many years, prove that moisture penetration has less effect on the holding power of Never-Creep Anchors than on any other type of anchor.

This dependability, plus ease, simplicity and speed of installation has made Never-Creep Anchors the preference of utility men for many years.

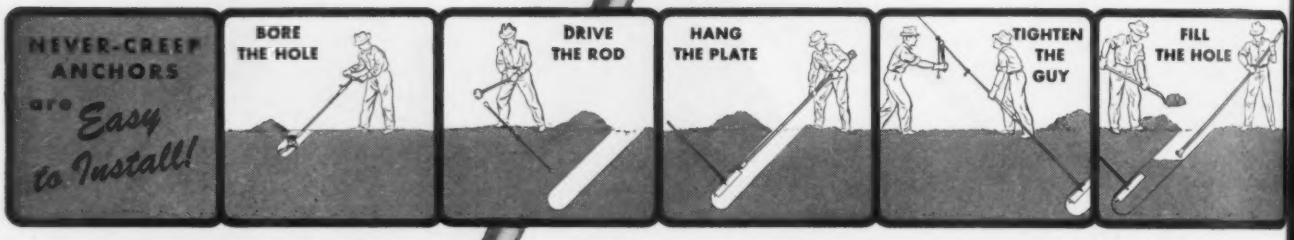
Now the Never-Creep has been improved by reinforced steel construction — it is better than ever before!

Improved Thimbleye Forged Steel Rod

This high strength, forged steel rod is painted for easy driving through solid earth and features the famous improved Chance Thimbleye.



1. Full rounded eye protects strand at varied angles, aids slack pulling.
2. Groove fits snugly around strand and prevents spreading.



Reinforced STEEL PLATE

Never-Creep Anchor plates are formed of high strength structural steel, reinforced with a high carbon steel core plate. Three plates are welded together in the area of greatest pull. Creep guards are welded to the top of the plate. Socket has reinforcing ribs.

How much will an anchor HOLD?

Chance engineers have developed a new formula for determining the type and kind of anchor to use for every guying condition. Your copy is ready and will be sent upon request.

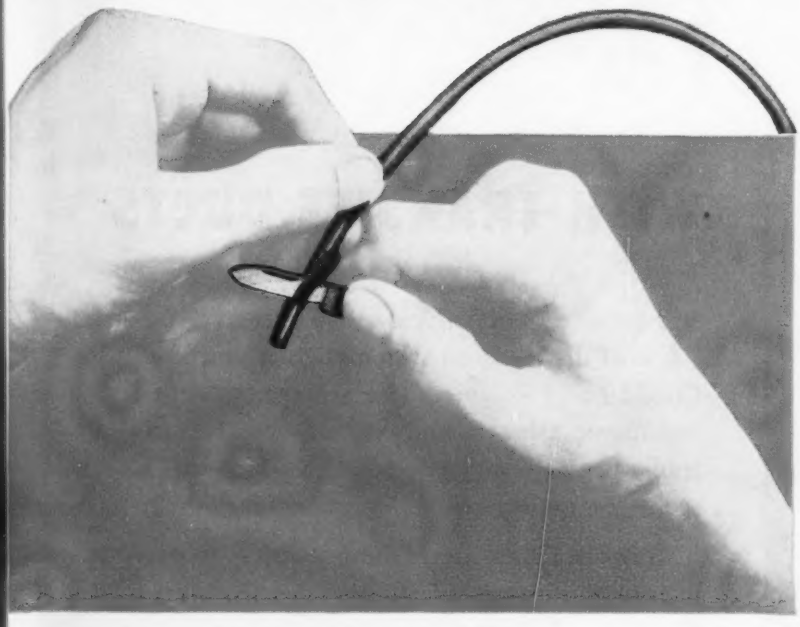
C4715A

A·B·CHANCE CO·

CENTRALIA, MISSOURI · SAN FRANCISCO, CALIFORNIA

ABC INDUSTRIES

CLEANEST Strip-act OF THEM ALL



You can try it yourself if you're a skeptic. Notice the clean cut and the free break-away that means a "happy ending" as you strip a piece of General Electric's thermoplastic building wire. Compare the time — and the result — with any other insulation. Then figure it all in *time on the job.*

While you're at it, reassure yourself on the abuse that General Electric thermoplastic will take, back of the stripped end. Twist it! Scrape it! Try to burn it, if you like — General Electric thermoplastic may char, but it will not support combustion.

Of course, the real cost-saving advantages of this modern type of building wire begin to register when you use it on the job. It saves time by pulling easily. It has made possible building wires of small diameter, without lowering insulation standards.

Because General Electric was first in introducing thermoplastic wire, it has always been first in the experience necessary to make the uniform, well-centered, fully tested Types T and TW wires that are attracting new users so rapidly today. You don't have to take our word for it . . . try this modern wire for yourself. Write for a sample — and more facts — to Section W56-825, Appliance and Merchandise Department, General Electric Company, Bridgeport 2, Connecticut.

Thermoplastic
First . . . and foremost
Type T Building Wire

GENERAL ELECTRIC

AROUND THE CIRCUIT with your Merchandise Distributor

LOOK AROUND the next time you call on an industrial customer, and you'll notice dozens of uses for heavy rubber-jacketed cords. Notice the variety of electric equipment that requires this type of cord. Looks like good business . . . and it is, both in volume and profit. General Electric makes rubber-jacketed cords in many sizes and constructions. They are built for long service and outstanding performance. We'll be glad to tell you more about them.

HOW ARE THINGS down on the farm? Are you getting your share of the rural electrification jobs? One good way to be ready for them is to check the advantages of BraidX,* General Electric's nonmetallic sheathed cable for new wiring or rewiring. Especially suitable for farm wiring, BraidX resists moisture and the effects of weather . . . retards flame. It strips cleanly and readily, it is easy to install. Available in sizes 14 to 4, with two, three, or four conductors, with or without ground wire.

SPECIAL WIRING JOBS call for wires and cables made for special service. In the big family of General Electric wires and cables, you will find rip cords, shot firing cords, bus drop cables, telephone wire, brewery cords, fixture wires, and dozens of other types for virtually any application. Let us help you pick the right wire for that next unusual installation.

*Trade-mark Reg. U. S. Pat. Off.

Reduce Cableway Costs

WITH TRANSITE DUCTS

YOU GET EVERY ADVANTAGE necessary for lowest cost distribution systems when you use Transite Conduit and Korduct. The greater strength of Transite—made of asbestos and cement—protects cables from traffic pressure and vibration. Tight joints shut out seepage—reduce possibility of water damage to sheath.

Transite Ducts are incombustible—this confines burnouts, protects adjacent cables from fire. Transite Ducts give lasting service because they are inorganic and non-metallic . . . immune to rust, rot, corrosion and electrolysis.

When streets must be opened, however, for cable installation or direction changes, the job can be done faster with Transite Ducts for several reasons. Long, lightweight lengths—a complete line of fittings—simple coupling method—all combine to make faster assembly. Smooth bore makes long cable pulls easier.

For further information explaining how Transite Ducts reduce cableway costs, write for Data Book DS 410, Johns-Manville, Box 290, New York 16, N. Y.

JOHNS-MANVILLE JM PRODUCTS

Johns-Manville

TRANSITE DUCTS

CONDUIT for use without concrete

KORDUCT for concreting in

Are you getting Maximum

Productive Power

FROM YOUR PLANT ELECTRICAL SYSTEM?

Up-to-date production machinery cannot be utilized fully with an obsolete power distribution system. Efficient methods of manufacturing demand modern electrical power supply and control.

Thus, getting *maximum* Productive Power from your plant electrical system is of vital concern to every key production man—as well as those directly in charge of electrical installations and maintenance.

On the next two pages you will find specific ways to make *electrical power more productive* —one or more of which can be put to profitable use in your plant.

FOR ANSWERS TO QUESTIONS LIKE THESE—TURN THE PAGE

1. What is the most flexible and economical distribution system to meet changing production requirements?
2. How is a large steel plant saving $1,500.00 per month in power costs?
3. How are automatic circuit breakers saving $2,000.00 per year in outage costs?
4. How can control centers improve continuous processing operations?
5. What type of power conversion has cut maintenance costs as much as 66%?

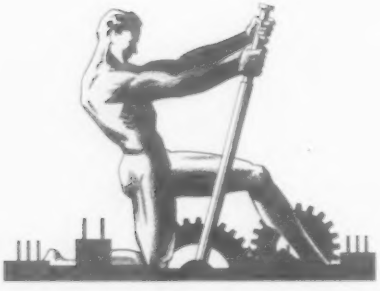
WESTINGHOUSE

Westinghouse

PLANTS IN 25 CITIES . . . OFFICES EVERYWHERE

Proved ways to **Make Electrical**

TO SPEED PRODUCTION CHANGEOVERS.

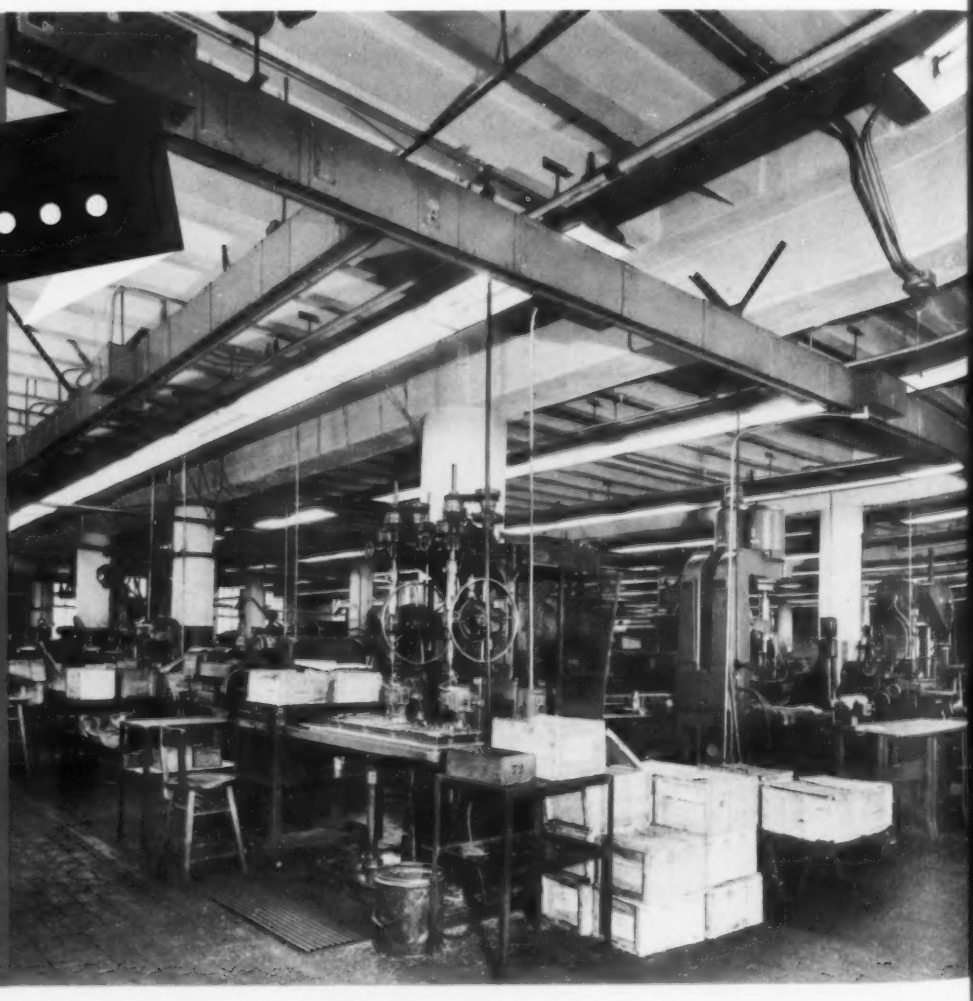


PRODUCTIVE POWER

Check these typical examples of the ways improved power distribution and utilization can boost plant efficiency. They are equally adaptable whether you are planning a new plant or modernizing existing facilities.

These are but a few of the time-saving, cost-cutting applications possible with the complete line of Westinghouse plant electrical equipment. Skilled Westinghouse engineers, with a practical knowledge of production techniques in *your* industry, are ready to help you on specific problems. For engineering help, just phone or write your nearest Westinghouse office.

FASTER . . .



Bus Duct speeds production changeovers . . . in this large Chicago plant. Machinery can be relocated faster, since power is taken off wherever needed by plugging in right at the load. Flexible, convenient power distribution is provided without long secondary cable runs. Future production line shifts need not be delayed by expensive relocation of power distribution facilities.

WESTINGHOUSE

Power More Productive

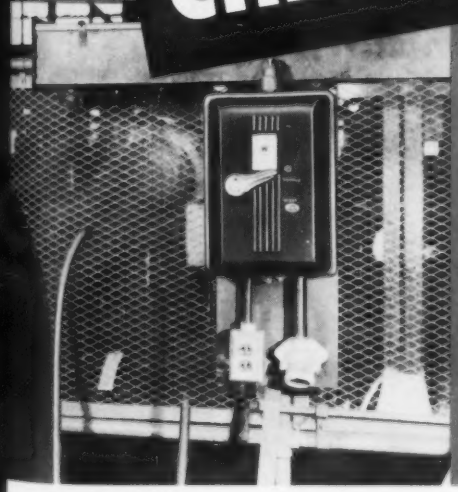
CUT POWER COSTS...REDUCE MAINTENANCE

BETTER...

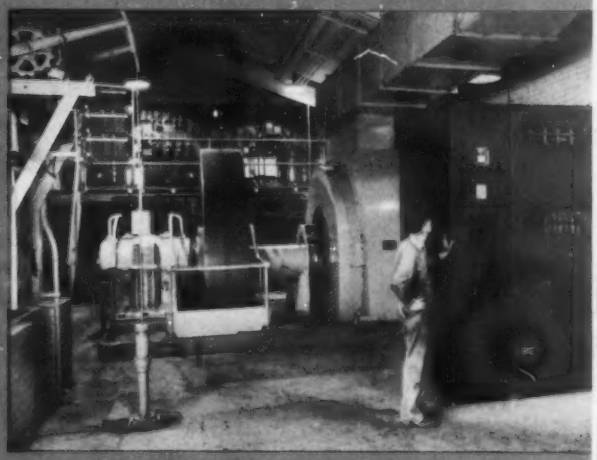
Control Centers improve operation, increase safety, cut service time . . . . . . In a large mixing room—where 85 motors drive synchronized conveyers, sand mixers and slingers—a Westinghouse Control Center replaced individual starters. Result: centralized, interlocked control of all operations; greater safety for personnel; important savings in service time on individual operations located 200 ft. or more apart.

Ignitron Rectifiers can operate automatically and unattended. With no major moving parts to require maintenance, the Ignitron delivers power continuously, 24 hours a day. Maintenance costs can be reduced as much as 66% by use of Ignitron Rectifiers in place of standard motor-generator sets.

CHEAPER...



AB-I Breakers eliminate outage costs. When an AB-I Breaker interrupts the circuit due to abnormal conditions, service can be restored immediately—there is nothing to replace. In a typical steel mill installation, savings in production, man and machine hours, and replacement costs amount to over $2,000.00 a year.



$1,500.00 Monthly Savings . . . effected in this Eastern steel plant by the use of two 1260 kva Capacitors—one unit shown here. Cost of the Capacitors was offset by power savings in eight months time.

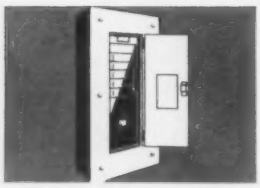
Westinghouse

PLANTS IN 25 CITIES . . . OFFICES EVERYWHERE

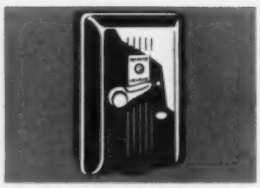
Here's the complete line of Westinghouse power distribution equipment →

FOR ANY POWER DISTRIBUTION PROBLEM Westinghouse OFFERS

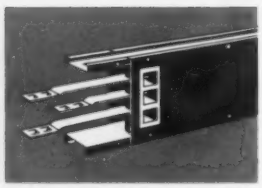
THE RIGHT EQUIPMENT..APPLICATION HELP



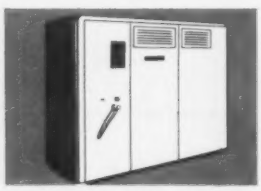
CONVERTIBLE AB "DE-ION" DISTRIBUTION PANELBOARDS are available for circuits from 15 to 600 amperes, inclusive; 600 volts a-c, 250 volts d-c.



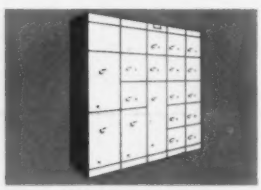
AB-I BREAKERS are built in ratings from 15 to 600 amperes at 125 to 250 volts, d-c; 115 to 600 volts a-c. Individually calibrated at factory. Sealed to prevent tampering.



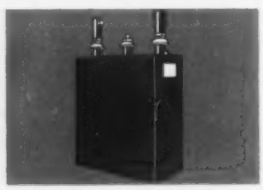
PLUG-IN BUS DUCT ranges in capacity from 225 to 1000 amperes, for 2, 3 and 4-conductor applications. Built in 10' lengths, with plug-in openings at 12" intervals.



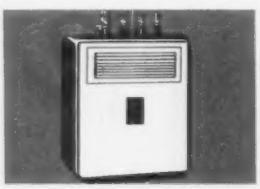
POWER CENTERS are available for voltages up to 15,000, 3-phase, 60-cycle, with capacities of 100 to 2,000 kva, depending upon the voltage.



CONTROL CENTERS to handle combinations of: squirrel-cage motors from 1 to 100 hp, three-phase, 220 to 550 v.; unit starters from NEMA sizes 1 through 4.

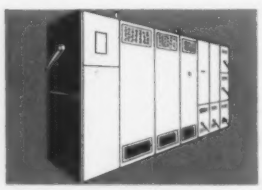


CAPACITORS for indoor mounting are built with single or multiple dust-tight covers; small or large racks; 7½ kva, 230 volts to 2520 kva, 13.8 kv.



ASL AIR-COOLED TRANSFORMERS are built in single and three-phase designs, rated from 150 to 500 kva, 2400 to 15,000 volts.

SAFETY SWITCHES are built in a wide range of models for ratings of 120, 240 and 575 volts a-c; 125, 250 and 600 volts d-c; 30 to 1200 amperes.



AIR-COOLED NETWORK SYSTEM UNITS—capacities of 300, 500, 750 and 1000 kva for high voltages from 2300 to 13,800 and low voltages of 125/216 (4-wire).

APPLICATION ENGINEERING

The how-to-do-it ability of Westinghouse engineers is available at any time to help solve power problems in your plant. This application engineering service applies the broad electrical and production experience gained in many fields of industry to your specific problems. Just contact your nearby Westinghouse office, and a competent engineer will call.

RESEARCH

The scope of Westinghouse research reaches into every industry. Wherever power is used and distributed, this research has played an important role in doing jobs better, faster, cheaper. Westinghouse research facilities are available at any time to help you use new production tools and apply scientific knowledge in finding practical solutions to production problems.

TRAINING MATERIAL

Westinghouse training material includes not only instruction courses in such subjects as electronics and resistance welding, but everyday help in all phases of the operation and maintenance of modern electrical equipment. This help is available in the form of printed literature and training films. Ask your nearest Westinghouse office to show you samples of this material.

MAINTENANCE

A nationwide chain of 34 Westinghouse Manufacturing and Repair Plants offers speedy, effective help on all types of electrical service and repair. A skilled corps of specialists, on call through your nearby Westinghouse office, is ready to help you at any time.

RENEWAL PARTS

Parts warehouses in 29 cities carry complete stocks of genuine Westinghouse renewal parts. Westinghouse distributors—in addition to their own stocks—can secure parts promptly from warehouse or factory stocks.

Mail coupon for more information

Westinghouse Electric Corporation
P. O. Box 868, Pittsburgh 30, Pa.

Please send me more information on the following products:

____Panelboards	____Power Centers	____ASL Transformers
____AB-I Breakers	____Control Centers	____Safety Switches
____Bus Duct	____Capacitors	____Network Units
____Lighting		____Ignitron Rectifiers

Name_____ Company_____

Title_____

Address_____ City_____ State_____

PRODUCTIVE POWE

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HELP

GINEERING

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WESTING

POWE

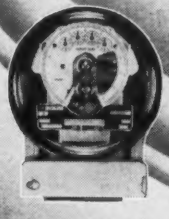
MEASURED DEMAND

assures recovery of fixed charges

SANGAMO DEMAND INSTRUMENTS

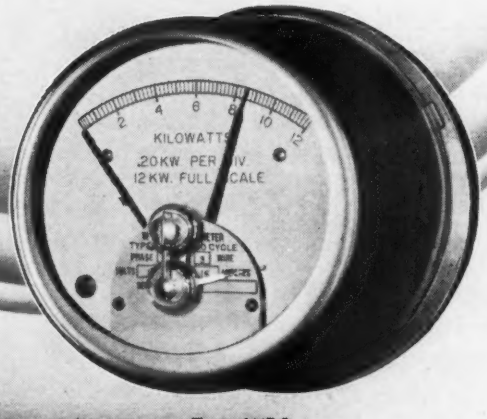
The increasing dissimilarity of modern loads of commercial customers makes it impractical to use averages in establishing a sound basis for recovery of fixed charges. The large proportion of plant investment in relation to the total cost of service deserves exact determination of demand. This can best be done by measurement. Sangamo Lincoln-Type WD Demand Meters are simple, accurate, and economical instruments for this purpose. Sangamo Demand Instruments are available in an extensive line—designed for your particular needs.

Type JWS



Type LC-3 with LG Demand Register

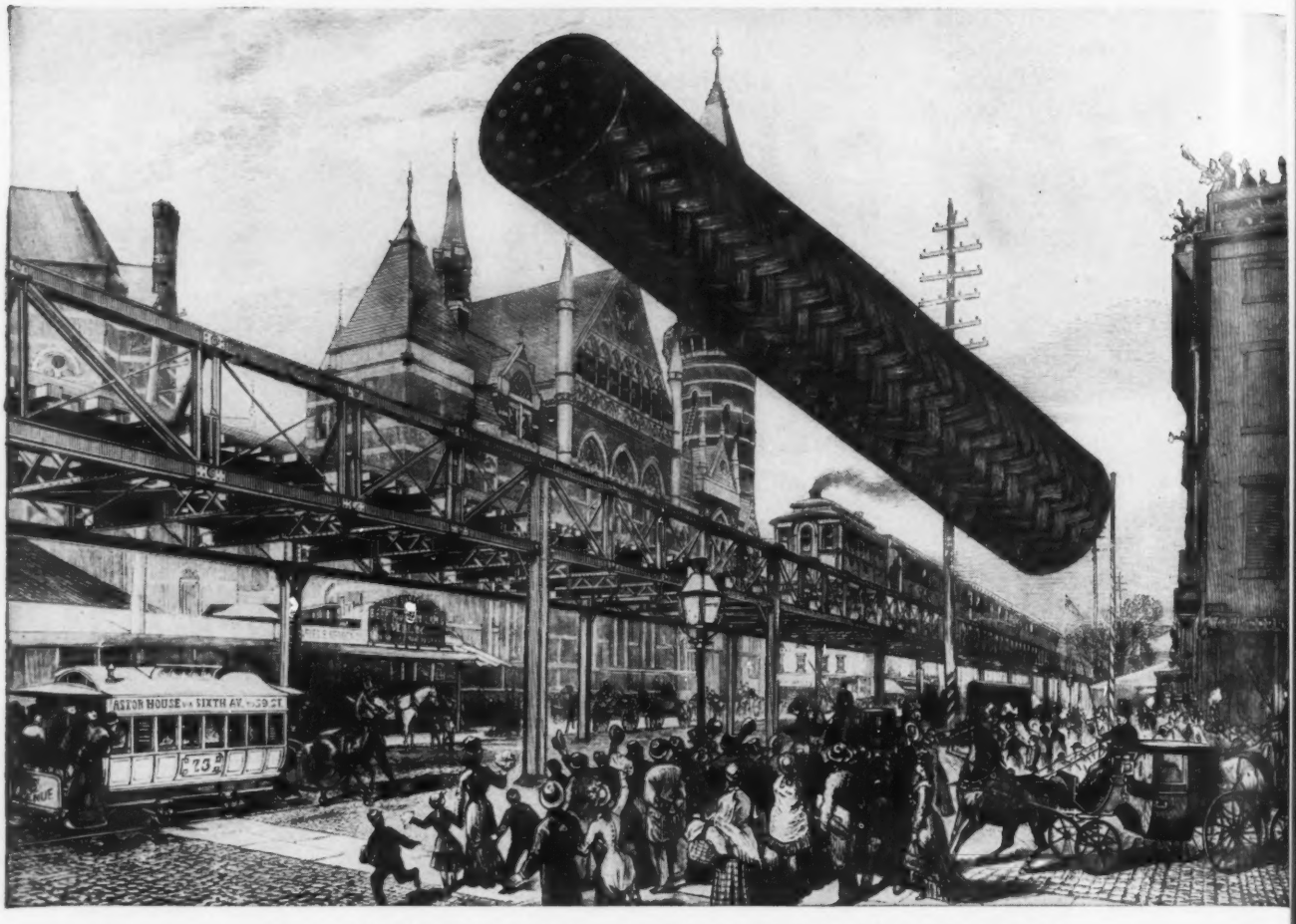
Combination Watthour and Lincoln Demand Meter, and meter with demand register, for installations where mounting space is limited.



Type WDS

Sangamo Lincoln-Type WD Demand Meters are made in both A and S construction for any singlephase or polyphase circuit for the measurement of kilowatt demand. Operating independently of the watthour meters, these instruments are a convenient means of obtaining demand on existing watthour meter installations, as well as on new services.

SANGAMO ELECTRIC COMPANY
SPRINGFIELD • ILLINOIS



Segment of Kerite cable after 50 years' service on the New York Sixth Avenue "el."

Returned to stock after 50 years' service

IN 1889, a large amount of Kerite 600-volt telegraph cable was installed on the Sixth Avenue "el" in New York City. It was 19-conductor cable; all conductors were individually insulated No. 14 wire. The outer mechanical protection was provided by cotton braid, which was well preserved by painting.

Fifty years later, when the "el" was torn down, the Kerite cable was removed. The Kerite insulation was found to be live and sturdy. Electrical tests found the average breakdown voltage to ground of the 600-volt Kerite insulation on the 19 conductors to be 31.5 kv.

Most of the cable was returned to stock for future use!

Modern Kerite cable for similar service uses asbestos or glass braid which will not rot and which requires no maintenance. But the insulation itself is still made with the same Kerite that produced the insulation described here.

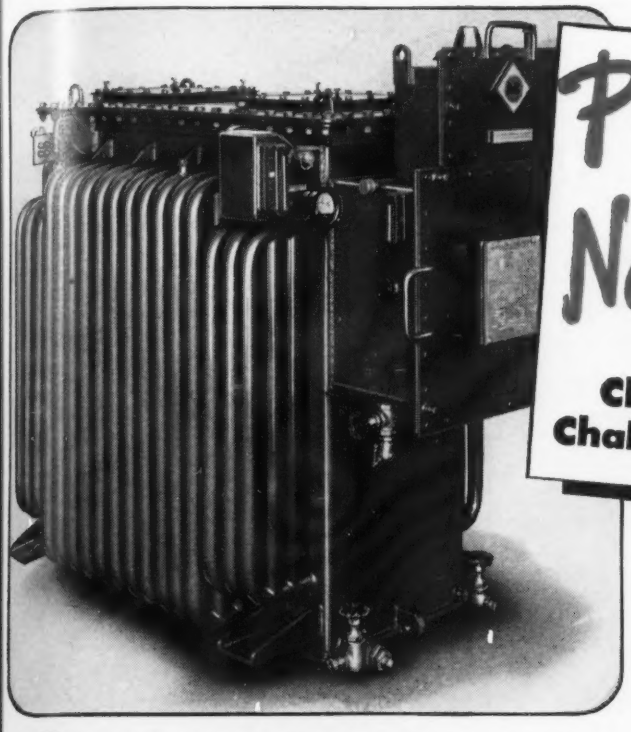
Kerite insulated wire and cable is available in many forms and for many purposes—low or high voltage, indoor, outdoor, aerial or submarine. Ask any Kerite user about its stamina and low cost per year. *The Kerite Company, 30 Church Street, New York 7, N. Y.*

Offices also at: 122 S. Michigan Avenue, Chicago 3; 582 Market Street, San Francisco 4; 714 W. Olympic Blvd., Los Angeles 15.

Kerite Insulation—Your Cable's Best Life Insurance

KERITE CABLE

Pacific Coast Representatives: Carlo Baldassari, 582 Market St., San Francisco 4
Robert A. Young & Co., 714 Olympic Blvd., Los Angeles 15

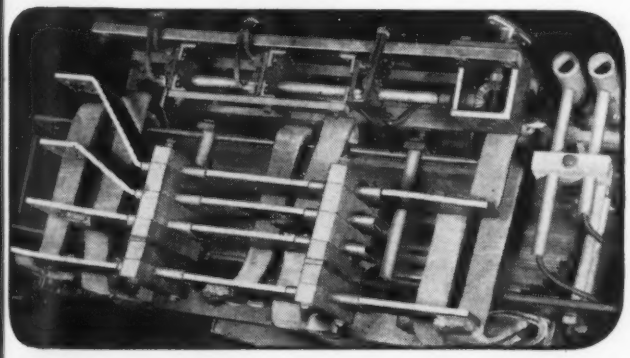


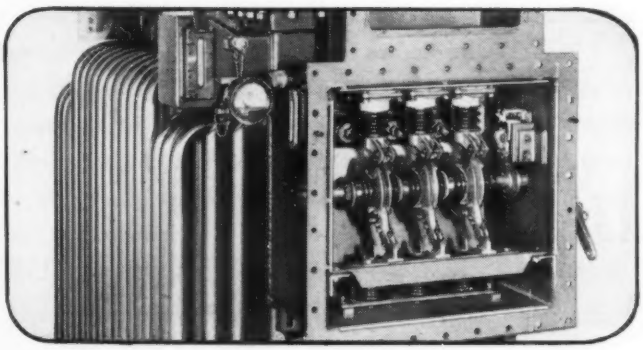
Planning a New Network System?

Check These Improved Allis-Chalmers Network Transformers

1 ALLIS-CHALMERS IMPROVED Network Transformers can be designed to meet *any* system specifications—size, electrical characteristics, accessories. They are smaller in overall size, yet there is no reduction in rugged design typical of this transformer class.

2 THE LOW VOLTAGE THROATS of Allis-Chalmers *improved* network transformers are designed to fit *any* standard network protector. Result: you can "team up" the protector you want with the transformer you want . . . and get the best in *both!*

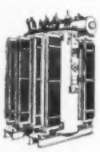




3 CHECK THIS COMPACT, LOW-LOSS DESIGN! Rugged "A-C" circular coil design withstands heavy short-circuit stresses. Thermal capacities are high—for cool operation under severest load conditions. Allis-Chalmers, Milwaukee 1.

4 STANDARD DISCONNECT AND GROUND SWITCH—capable of breaking magnetizing current of the transformer. Electrical interlock prevents switch operation when transformer is loaded. GET THE FULL STORY IN BULLETIN B6152.

TRANSFORMERS ALLIS-CHALMERS BUILDS:

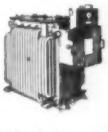


POWER — 500 kva to largest. Dry-type or liquid-filled.

5/8% STEP REGULATORS — single phase 2.4 to 15 kv; 3-phase 2.4 to 69 kv.

DISTRIBUTION — 1½ to 500 kva. Pole, vault, subway, substation and dry-types.

LOAD CENTER—100 to 2000 kva. Dry or liquid-filled. Indoor or outdoor.



NETWORK—150 to 1000 kva. Vault or subway types.

FURNACE — Indoor or outdoor. Water or self-cooled. All ratings.

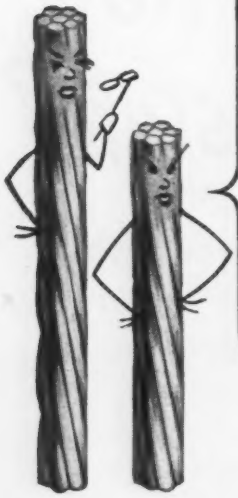
INSTRUMENT — potential, current, and signal, indoor and outdoor types; outdoor metering. Standard voltages.

ALLIS·CHALMERS

One of the Big 3 in Electric Power Equipment — Biggest of All in Range of Industrial Products

1847 1947 A CENTURY OF SERVICE to Industry THAT MADE America Great

A 2262



What's She Got That We Haven't Got?

Why, the answer is bethanized coating, of course.

And in this case, beauty is more than skin-deep.

A bethanized coating gives vital protection to your Bethlehem strand—protection against the corrosive effects of moisture, smoke, and acid fumes. And it's so ductile it virtually eliminates the hazards of checking, peeling, and flaking.

Bethanizing is an exclusive Bethlehem process of zinc-coating wire. The protective "armor" is applied electrolytically. This method provides a coating of *uniform* thickness both around and along the wire. It has a further advantage in that it does not impair the toughness or other desirable physical properties of the base wire. The coating is available in A, B, and C weights—you pick the one that best meets corrosive conditions in your particular area.

Remember, Bethlehem strand is the *only* strand that is furnished with a bethanized coating.

BETHLEHEM PACIFIC COAST STEEL CORPORATION

Sales Offices: San Francisco, Los Angeles, Portland, Seattle, Salt Lake City, Honolulu

BETHLEHEM PACIFIC

Combining Modern Circuit Protection AND Distribution

SQUARE D *Multi-Breaker* SERVICE ENTRANCE DEVICES

All the modern advantages of Square D Multi-Breaker Control, *plus* the advantage of adequate distribution—combined in the new SQUARE D MULTI-BREAKER SERVICE ENTRANCE DEVICES.

Compact in design, yet flexible enough to provide for 37 different Multi-Breaker circuit arrangements—these devices are ideal for use as service entrance equipment on homes where additional circuits are needed for range, water heater, food freezer, etc. You have only *one* cabinet to install—costs reduced to a minimum.

Raintight — Interchangeable Hubs Being raintight in themselves, these Multi-Breaker devices require no unsightly weather-protecting enclosures. They are provided with SQUARE D INTERCHANGEABLE HUBS—five different bushings to fit five different conduit sizes. Installation may be surface or semi-flush. In addition, there are ample combination knockouts in the bottom of each cabinet.

Specify SQUARE D MULTIBREAKER SERVICE ENTRANCE DEVICES.

Wherever electricity is distributed and controlled

SQUARE D COMPANY

LOS ANGELES • DETROIT • MILWAUKEE

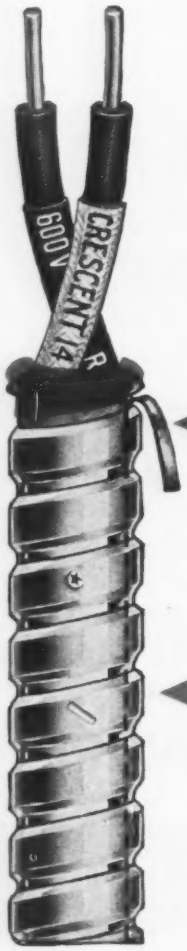
CRESCENT
ABC Armored Cable

Has These Improved Features Which Result in

INCREASED SAFETY

and

LOWER COST



Bond Strip Under Armor

Permanently low armor resistance **is provided in sizes No. 14 and 12 AWG by use of a flattened bonding wire which is in contact with the under side of each convolution. These sizes now are smaller and lighter, since they use the smaller diameter Type R conductors of the 1947 National Electrical Code.**

Prefabricated Break Lines

The Cut Mark (at 1½″ intervals) shows the location of a prefabricated breaking line inside the armor. Only a few strokes of a file guided by the Cut Mark are required to cut through one outer ridge, and a bend by hand severs the armor. This results in a clean separation with no sharp edge — a safer, easier and faster job. The prefabricated breaking lines are so designed that there is *no reduction* in tensile strength, bending quality, crushing resistance and electrical conductivity of armor.

The Armored Cable Industry is celebrating its 50th Anniversary. In the last 20 years alone over SIX BILLION FEET of Armored Cable have been installed.

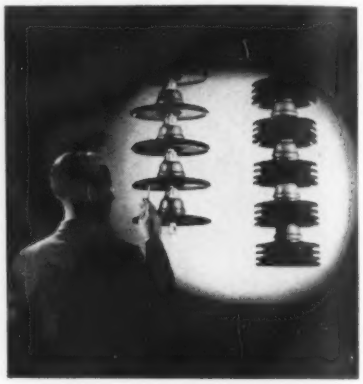
CRESCENT
WIRE and CABLE

CRESCENT INSULATED WIRE & CABLE CO.
TRENTON, N. J.

PRODUCT NEWS

Fog-Type Insulators (800)

Two suspension fog-type insulators have been developed by the Locke Insulator Corp. No. 18212 with clevis and tongue hardware (or No. 18219 with ball and socket) is recommended by the manufacturer where driving, washing rain or wind storms are common. It offers a single, smooth-surfaced shell, easily cleaned, a flat 12-in disc giving ample space between units for hot-line maintenance work, with adequate arcing distance around the shell; compression glaze construction to reduce breakage; large diameter pin at the cement line to minimize danger of pitting or corrosion of pin.



No. 18226 with cleavis and tongue hardware (or No. 18229 with ball and socket) is for use where driving, washing rains and winds are infrequent. It has the same general features as No. 18212 but differs in that the total leakage distance around the shell is 18 in. and the diameter is 10 in., allowing inside clearance and providing more clear arcing distance between the bottom of the shell and the cap of the next lower unit. Greater vertical dip distance between shells is provided and a vertical skirt inside the shell provides additional protected leakage distance.

Insulating Varnish (801)

Synthite AJR-7 is a bakelite base insulating varnish made by John C. Dolph Co. for all types of wound coils. The manufacturer claims that this varnish will cure rapidly and completely at temperatures lower than those required for most varnishes of a similar type. It can be applied by either atmospheric dip or vacuum impregnation and is said to produce excellent results whether baked under infrared or in conventional electric or gas ovens.

Electrolytic Capacitors (802)

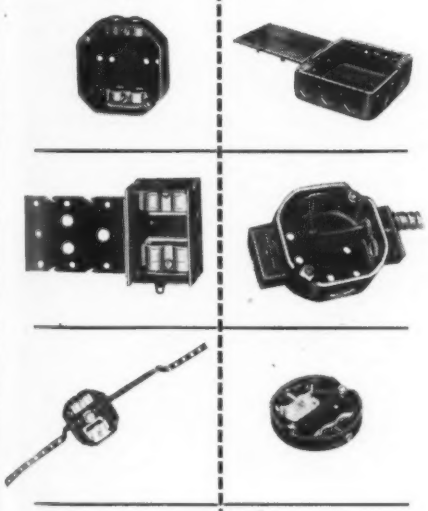
A line of plug-in electrolytic capacitors claimed to be well suited to experimental, test and other applications where quick capacitor changes are required, has been announced by Cornell-Dubilier Electric Corp. These Type QC units are hermetically sealed in round aluminum containers and are provided with a 4-in. octal-base mounting permitting ready removal or replacement in standard tube sockets.

You can always rely on Raco

RACO BLNO BOX

A new bracket on a nationally popular box—especially suited for Romex. Beveled corners; knock-outs are "Pri-Out" equipped.

A BOX FOR EVERY NEED



RACO Switch and Outlet Boxes

Profit by the line of least sales resistance! It's no secret that designers, architects and electrical contractors—the country over—prefer and demand the RACO line. There's a box and cover, accurately made and machined, tailored to fit the particular needs of every type of installation. Sturdy RACO boxes in their smooth, lasting black or galvanized finish, are built to do the job right!

★ ★ ★

A-S-E STEEL PRODUCTS FOR MANY USES

STEEL OFFICE FURNITURE • WARDROBE, STORAGE, AND COMBINATION CABINETS • CLOTHING LOCKERS • INDUSTRIAL EQUIPMENT FOR FASTER MATERIALS HANDLING • FROZ-N-FOOD LOCKERS • ELECTRICAL OUTLET AND SWITCH BOXES.

ALL-STEEL EQUIPMENT, INC., 500 Kensington Avenue, Aurora, Illinois

RACO

ALL-STEEL PRODUCTS

A Complete Line of Switch and Outlet Boxes

ALL-STEEL EQUIPMENT, INC.

Linemen are Kleinmen

• Over the years the men who string and maintain the nation's power and communication lines have come to know and rely on Klein Pliers. That's why you will find Klein Pliers in the hands of the man on the pole—why linemen are Kleinmen.

And there's good reason back of this preference for these quality tools. Drop forged from fine alloy steel, each pair individually tempered and tested, Kleins have just the proper balance . . . just the right spring to the handles to minimize hand fatigue. A fitted hinge keeps jaws perfectly aligned . . . carefully matched knives stay keen.

Keep Klein Pliers on order—your supplier will meet your requirements as soon as possible.

Ask Your Supplier

Foreign Distributor: **International Standard Electric Corp., New York**

A copy of the Klein Pocket Tool Guide, showing the Klein line and containing valuable tool information, will be sent on request.

Since 1857

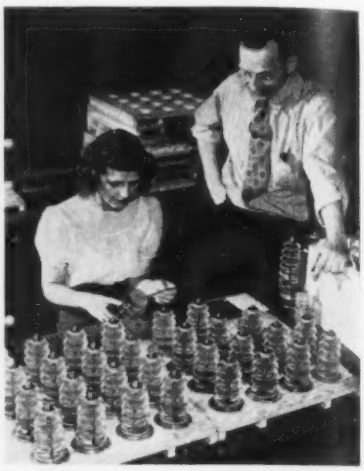
Mathias KLEIN & Sons

Established 1857 **Chicago, Ill., U.S.A.**

3200 BELMONT AVENUE CHICAGO 18, ILLINOIS

Pyranol Capacitors (803)

Pyranol capacitors with cast glass bushings recently announced by G-E are made of exceptionally stable, low-expansion glass in which are cast metal inserts of a special nickel-steel alloy. The thermal expansion characteristics of the alloy are coordinated with those of the glass. A metal mounting flange cap is fused directly to the glass and



the flange is in turn welded and soldered to the capacitor case, forming a hermetic seal said to be permanently moisture tight.

According to the manufacturer, these bushings are practically unaffected by weathering, micro-organisms and thermal shock. When excess potential of 60 cycles or impulses are applied, the bushings will flash over externally rather than puncture or shatter, even though external creepage and strike values are large, it is claimed. The bushings are equipped with a split-type solderless connector, assembled after completion of the capacitor.

Miniature Capacitors (804)

Solar Mfg. Corp. has added a miniature dry electrolytic capacitor series, Type LB. Capacitance values available for low-ripple service in a ⅜ x 1⅛-in. container range from 8 mf. at 150 wvdc. to 200 mf. at 15 wvdc; in a ⅜ x 1⅝-in. tube maximum capacitances range from 12 mf. at 150 wvdc. to 300 mf. at 1.5 wvdc. Maximum a-c ripple voltage which may be applied to capacitors rated at 100 wvdc and greater is 7 volts at 60 cycles or 3.5 volts at 120 cycles.

Tubular Capacitors (805)

A super-small model of its type BR electrolytic tubular capacitor is available from Cornell-Dubilier. Designated Type BBR, these units are for ultra-compact assemblies which call for low-voltage, high-capacity capacitors. They are hermetically sealed in cylindrical aluminum containers. The negative lead is riveted to the case at one end; the positive lead is anchored to a specially designed terminal brought out through a Bakelite washer at the other.

Mine Trailing Cable (806)

A new mine trailing cable, devised by two Salt Lake City engineers, is being demonstrated by U. S. Rubber Co. It features a copper braid over the conductor to trap current leakage and routes it through a sensitive circuit breaker that cuts off the power before arcing can occur.

NATIONAL ELECTRIC FLEXSTEEL

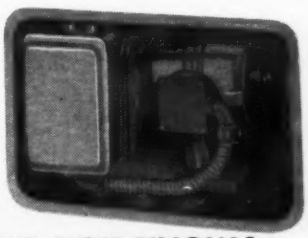
FLEXIBLE STEEL CONDUIT

available for immediate shipment

An inexpensive conduit system for the finest types of construction. Use it in locations not subject to dampness, acids, fumes, oil or gasoline.

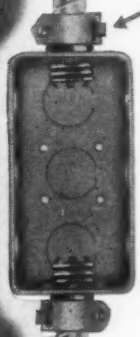
Your National Electric Wholesaler sells FLEXSTEEL flexible steel conduit.

NATIONAL ELECTRIC PRODUCTS
WIRING SYSTEMS
WIRES AND CABLES

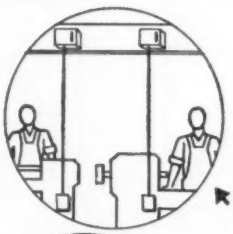


DO YOU KNOW?
—that leading machine-tool and apparatus manufacturers use N.E. Flexsteel for its strength and flexibility to protect motor leads and machine wiring.

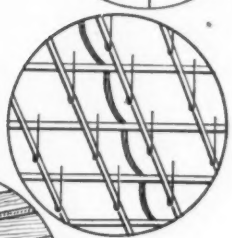
NEW N. E. *STAMPED-STEEL* CONNECTOR

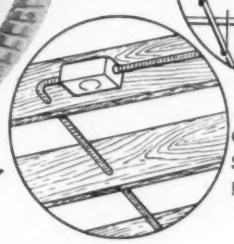


- NO SPECIAL TOOLS
- NO WASTE
- QUICKLY INSTALLED



FACTORIES AND MILLS





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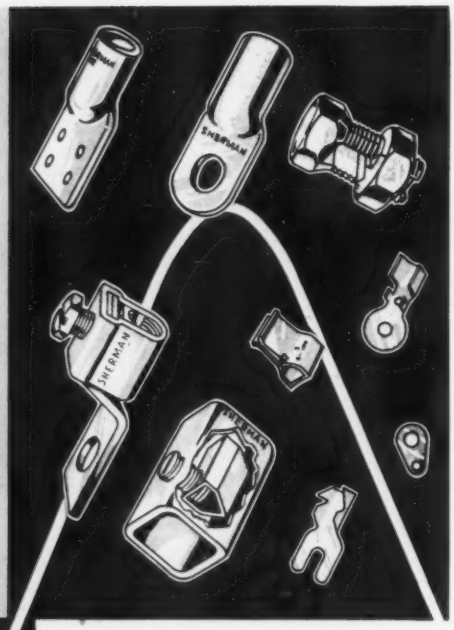
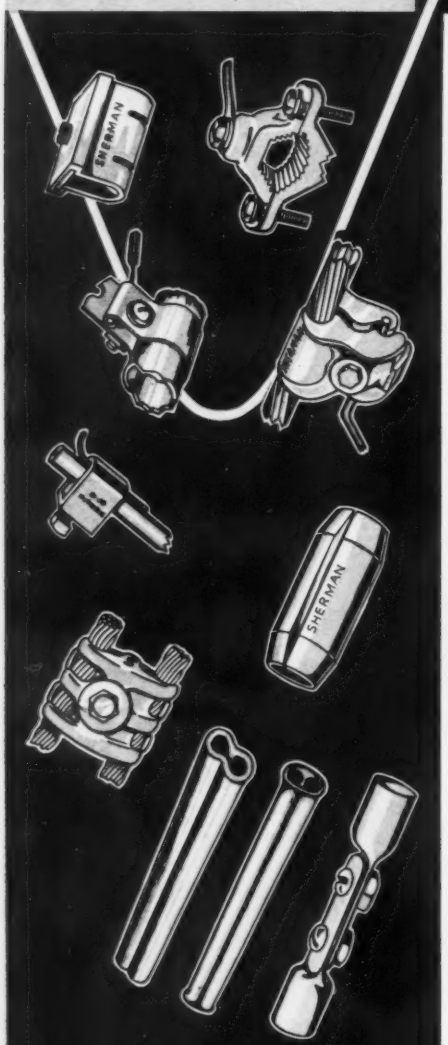
COMMERCIAL BUILDINGS, STORE ROOMS AND PUBLIC BUILDINGS

National Electric Products Corporation
Pittsburgh 30, Pa.

for Dependable
ELECTRICAL
CONNECTORS
Specify
Sherman





Sherman Electrical Fittings are produced by a firm which has developed and grown up with the Electrical Industry.

For fifty years Sherman has specialized in the production of small copper and brass fittings. Through most of that period, Sherman production men have worked with the leading engineers of the Electrical Industry, to solve each new connector problem as it came up.

Today the Sherman line of Electrical Fittings is famous everywhere for its uniform quality and dependability. Engineers know that Sherman Connectors can be relied on to give lasting good service, under the difficult service conditions so often encountered.

Compared with other, more expensive circuit components, a connector is only a small item. Yet in service, the continued reliability of the connector becomes highly essential. For that reason, it pays to specify Sherman Connectors of time-tested quality and dependability.

H. B. Sherman Mfg. Co.

Battle Creek, Michigan

Available only through preferred Electrical Wholesalers.

Motor Starter (807)

Low-voltage protection with push-button control is a feature of the new Westinghouse magnetic Farmstarter for single-phase motors. This 3-hp. unit has dual voltage coils and will serve for a 1½-hp. motor when operating on 115-volt single-phase service or a 3-hp. motor on 230-volt service. It is especially designed for farm applications and is intended for across-the-line motor starting service. Special features include: De-ion arc quencher; solid silver contacts; solderless connectors; bimetallic overload relay that requires no replacement parts to restore service after overload; built-in push-button control to simplify wiring. Remote control is possible with a separately mounted push button.

Breaker (808)

A single-pole, metal-tank reclosing breaker weighing 65 lb. for service on rural lines up to 15,000 volts has been designed by Westinghouse. Either four time-lag tripping operations before lockout or two instantaneous operations followed by two time-delay ones and lockout can be selected by changing a pipe plug, an operation which can be done in the field. When fast tripping is chosen, the first operation from parting of the contacts until closing is accomplished within 12 cycles or less. These GR reclosers are available for crossarm, direct-pole or extended pole-bracket mounting in 5-, 10-, 15,- 25-, 35- and 50-amp. ratings with interrupting caapacities from 150 amp. at the 5-amp. rating to 1,200 amp. at the 50-amp. size.

Spotwelder (809)

The Adams portable spotwelder, invented during the war by a riveter in a West Coast shipyard, is being manufactured by the George H. Buckler Co. Claimed to reduce riveting time on an average bulkhead to four minutes, the device consists of a welding gun, a specially designed transformer heat control dial and timing device. The gun comes in two models—a pistol type, with adjustable pressure at welding points, and a push type which permits spot welding of large surfaces that cannot be reached by the pistol model. The 90-amp. transformer is on casters. The heat control dial, when used in conjunction with the timing device and pressure adjustment, is claimed to give all necessary control required in welding materials of 16- to 22-gage thickness. This welder may be used with any metal except aluminum, it is stated.

UNITED STATES RUBBER COMPANY

SERVING THROUGH SCIENCE

"I ain't no ordinary turtle!"

RU wiring with **RU?** it's the coming "Code" wire

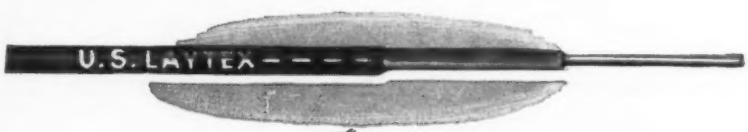
And Laytex (Type RU) is no ordinary wire. In physical and electrical properties, no other branch circuit building wire can compare with it.

Not only that, but Laytex is smaller in diameter than any other rubber insulated building wire. This means that in re-wiring, each conduit can hold more circuits—a wire man's dream come true.

Laytex (Type RU) is insulated with laminated walls of 90% unmilled, grainless natural rubber. The conductors are perfectly centered in this homogeneous sheath, thereby avoiding any chance of thin spots.

Scientists of United States Rubber Company have carefully compounded Laytex so that it is lighter in weight, easier to handle and install. The saturated cotton fibrous cover is flame-retardant and moisture-resistant.

UNITED STATES RUBBER COMPANY
1230 Avenue of the Americas • Rockefeller Center • New York 20, N. Y.



Specify RU Laytex*

ELECTRICAL WIRES

SAFETY FACTORS THAT PUT RU OUT IN FRONT

BULL'S EYE
The conductor is on dead center throughout every inch of the wire.

ELEPHANT INSULATION
Laminated walls of tough natural rubber insulation mean Laytex is safe.

SMALLER O.D.
Allows more circuits per conduit than in ordinary wire. Lighter weight.

*Reg. U. S. Pat. Off.

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SMOOT-HOLMAN COMPANY
SMOOT-HOLMAN
INGLEWOOD, CALIFORNIA
MADE IN U.S.A.
Offices in Principal Western Cities—Branch and Warehouse in San Francisco

Neutral Bar (810)

A new type of neutral bar has been announced by Ilsco Copper Tube & Products Inc. A feature is that panel manufacturers can buy the size required for a particular installation. In the 225-amp. unit illustrated are provided 42 outlets, all 1 63/64 in. apart. This distance is standard on the three sizes, 70-, 125- and 225-amp., regardless of the number of outlets. Special changes can be made on order. Outlets take No. 14 to No. 8 wire. Patent pending.

Solderless Connectors (811)

O. Z. Electrical Mfg. Co. reports that it is offering more than 30 different types of solderless connectors (for wire sizes from No. 12 to 2,000,000 CM) with a special Cadux plating which makes them suitable for aluminum building wire connections. The Cadux plating eliminates the electrolytic action which usually takes place between copper and aluminum.

New Angle Connector (812)

A 90° angle connector has been designed by Gedney Electric Co. for the new 1946 Code PVX cables. Designated Catalog AC-15, this connector accommodates 14-2, 14-3, 12-2 and 12-3 cables. It is made of malleable iron.

Television Capacitors (813)

Cornell-Dublier Electric Corp. has announced a new series of television capacitors, in various capacity and voltage ranges to meet specific needs. They are impregnated and filled with Dykanol and hermetically sealed.

Punching Machine (814)

E-Z Sort Electric Punch and Grooving Machine, desk model, is electrically operated and is claimed to groove a single card or a hundred with positive registration. Operator places cards in position; machine automatically trips and grooves. Manufactured by E-Z Sort Systems Ltd.

Mobile Unit, Rochester Gas and Electric Corp. Note economy of space—easy accessibility.

Pre-installation checks and regular operational inspections by William F. Bellor at Rochester Gas and Electric Corp. assure continuous and economical operation.

TIME saved—greater efficiency—lower costs—that's what utility engineers everywhere report when they install G-E 2-way Radio. For instance, H. A. Brown, Engineer of the Rochester Gas and Electric Corp., Rochester, New York, says:

"Power line maintenance has been improved, equipment and crews are controlled to better advantage, and we are making big savings."

General Electric's complete line of 2-way communications equipment, both 30-40 mc and 152-162 mc, provides an efficient system to meet your own special requirements. You can depend on it to establish instant reliable contact between service truck and headquarters when minutes count most.

It's easy to be sure of an economical, dependable system. Let General Electric handle the complete job from microphone to antenna. A General Electric sales engineer will be glad to help. For complete information and assistance in planning your radio system, call or write your nearest General Electric office or the General Electric Company, Electronics Department, Syracuse 1, New York.

LEADER IN RADIO, TELEVISION AND ELECTRONICS

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YES—
BRONCO 60
has DU PONT
NEOPRENE
JACKET

Wire and cable that will give even longer economical life. Bronco 60 with Neoprene jacket is made by our own exclusive process. The Neoprene jacket resists acid, alkali, oil, moisture, heat and sunlight.

Always Specify BRONCO *Send for new, Complete Catalog*

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INSULATED WIRE CO.
1001 East Sixty-Second St.
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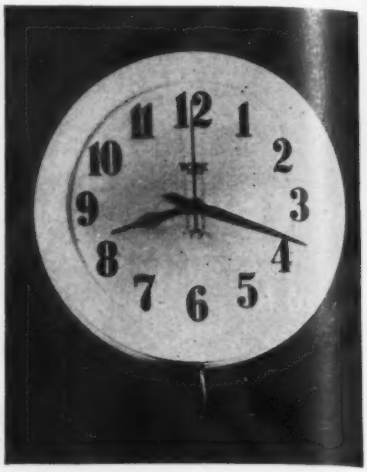
Wall Clock (815)



The Tork Safety-Set commercial wall clock features high reflectionless visibility and an electrosetting mechanism. Housed in a heavy spun-aluminum case, 16 in. diameter and 2¾ in. deep, the dial is almost 14 in. wide. On white and polished aluminum models, the hour and minute hands are black with a red sweep second hand; maroon models have white hands and numerals. Numerals are said to be easily readable at 100 ft. or more. The clock is for 110 volts; 60 cycles a-c.

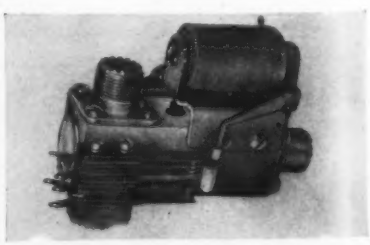
Cleaner-Blower (816)

A portable electric cleaner-blower added to the Ideal Industries is said to have increased cleaning action without increased pressure and the ability to run continuously 24 hours per day, if necessary. The heavy-duty model is powered by a 1 1/3-hp. motor, blows air at a velocity of 25,500 ft. per minute; weighs 14½ lb. The medium-duty cleaner has a 2/3-hp. motor; displaces air at 19,000 ft. per minute; weighs 9½ lb. Both models have precision type, sealed ball bearings and air stream cooling scrolls which permit continuous operation without overheating. If drying action is desired, a heater nozzle may be attached to the blower; raises air flow temperature to a minimum of 85°.

F Instant Starters (817)

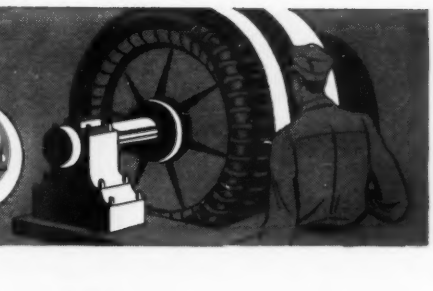
Solar Electric Corp. is distributing fluorescent instant starters under the trade name "P-D-Q." They are ready to install and fit all standard fluorescent socket holders; are Underwriters' approved.

Relay (818)



The Advance Series 7200 a-c or 8200 d-c relay was designed for SPDT switching of 50-ohm coaxial lines. Features are inspection port at top for easy access to internal ¼-in. silver contacts; 3/16-in. silver external contacts for simultaneous control of indicator lights and other associated circuits.

STANDARD ENGINEERS NOTEBOOK



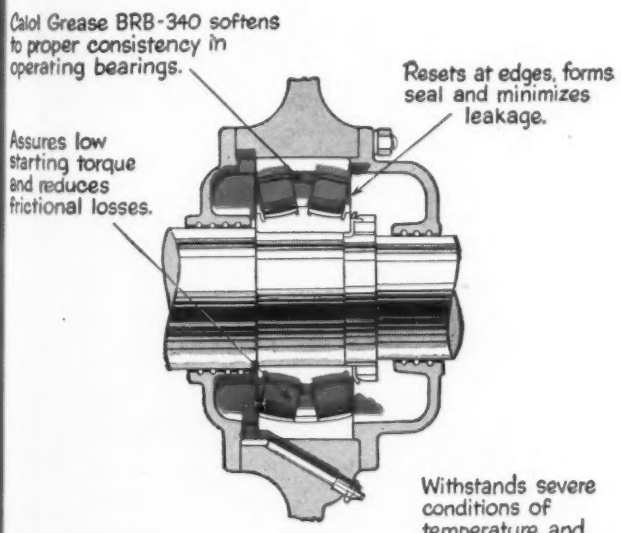
Anti-friction-bearing grease cuts frictional loss

Ball, and roller bearings in severe conditions of speed and temperature will start easier and operate with minimum running friction if they are lubricated with Calol Grease BRB-340.

This special grease is soft, smooth and has a fibrous texture. At high shear rates, it softens around balls or rollers to give complete coverage of all moving parts. However, because of its peculiar resetting ability, grease swept aside by balls or rollers stays hard enough to form a leak-preventing seal.

Calol Grease BRB-340 contains an unusual amount of high-quality oil stock which provides outstanding lubrication. Bleeding of this high oil content is eliminated by a special milling process.

In a bearing operating 10,000 rpm at 200°F. for 528 hours, Calol Grease BRB-340 showed no separation. The bearing was in good condition at the end of the test.


Calol Grease BRB-340 softens to proper consistency in operating bearings.
Resets at edges, forms seal and minimizes leakage.
Assures low starting torque and reduces frictional losses.
Withstands severe conditions of temperature and speed. Non-corrosive to metal.

Roller Bearing for Large Electric Motor.

This drawing prepared with cooperation of SKF Industries, Inc.

Chevron Cleaning Fluid is a light petroleum solvent containing a non-inflammable chemical compound.
High solvent power dissolves and washes out grease or oil quickly.
Completely and rapidly evaporates from bearing and housing.
Water-white in color and has no unpleasant odor.

This drawing prepared with cooperation of General Electric Co.

Chevron Cleaning Fluid dissolves old grease

The general cleaning of electric motors and generators and flushing of bearings can be speeded up by the use of Chevron Cleaning Fluid as the solvent. It has very high solvent power for oil and grease and contains a non-inflammable compound.

Many operators use Chevron Cleaning Fluid to flush motor bearings without removing them. They inject the fluid into the oil hole with the motor running and let it drain out the bottom. This is continued until the bearing is clean. Chevron Cleaning Fluid evaporates rapidly and completely and leaves bearings clean and dry.

Chevron Cleaning Fluid is excellent for removing wax from floors. It dissolves the wax so it can be wiped off with a rag or mop. This special solvent is water-white in color and will not harm fine fabrics or leather. It will remove grease from silk, furs, wool, kid, etc. without leaving a ring when used according to directions and if colors are fast.

Trademarks, "Calol," "RPM," "Chevron," Reg. U. S. Pat. Off.

Standard Fuel and Lubricant Engineers are always at your service. They'll gladly give you expert help — make your maintenance job easier. Call your local Standard Representative or write Standard of California, 225 Bush St., San Francisco 20, California

FOR EVERY NEED A **STANDARD OF CALIFORNIA** JOB-PROVED PRODUCT

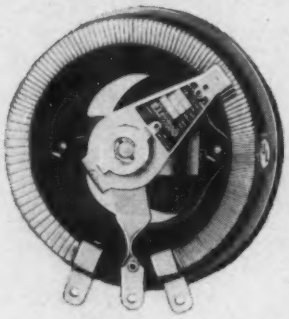
RESISTANCE CONTROL PROBLEMS

"Taper off"

When Rheostats are Sectionally Wound with DRIVER-HARRIS ALLOYS

To provide more uniform current control —and a rheostat of proportionately smaller size—the Ohmite Manufacturing Co. advocates tapered windings, involving the use of two or more sections of diminishing wire sizes. This construction is practical because only the first turn of any rheostat winding carries the maximum current. All succeeding turns carry constantly decreasing amounts.

In the 3-section, 500 watt Ohmite Model R Rheostat illustrated, three Driver-Harris nickel-chrome alloy wires — Nichrome* — Advance*—and No. 95 are employed to obtain the fine shading of resistance desired. For other resistance combinations, there are more than 80 Driver-Harris electrical resistance alloys specifically designed to fill the numerous requirements of the Electrical and Electronic Industries.



Backed by 46 years of specialized resistance-research experience, the Driver-Harris engineering staff is ready at all times to help you solve your electrical resistance problems. Why not get in touch with them for expert advice—or write for 71-page Resistance Handbook, R 46.

*Trade-Mark Reg. U. S. Pat. Office

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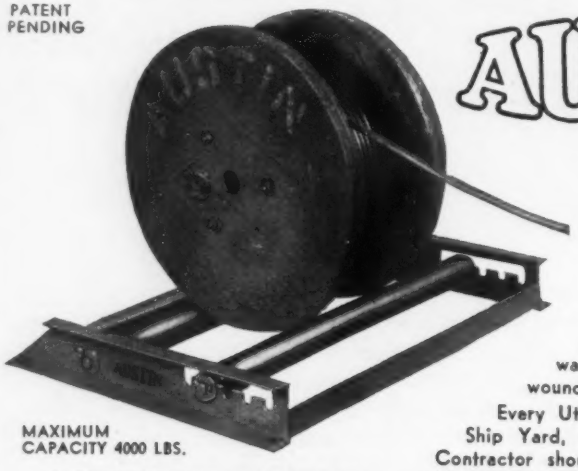

MAXIMUM CAPACITY 4000 LBS.

AUSTIN

NO. 600 REEL ROLLER

A new quick, easy, safe way to dispense any material wound on a reel.

Every Utility, R. E. A. Cooperative, Ship Yard, Railroad, Wholesaler and Contractor should have several AUSTIN REEL ROLLERS. When pulling one or more cables into conduit use an AUSTIN REEL ROLLER for each cable. Can be mounted stationary or used on the job as a portable device—ideal for service and repair trucks.

9 OUTSTANDING ADVANTAGES

(1) Ramp—makes it quick, easy and safe to load the reel.
(2) Back roller is slightly higher, preventing the reel from being pulled off the roller when cable is removed.
(3) Reel rolls on grease packed flanged ball bearings with the greatest of ease and safety. No backlash.
(4) Thumb screw, which when tightened, prevents roller from turning for easy and safe removal of reel.
(5) Lag screw hole in each corner for stationary mounting. Hole in each side for bolting rollers together.
(6) Heavy steel frame, painted bright orange, not only adds to its appearance, but, also, makes it readily visible on the floor which helps to eliminate accidents.
(7) Five adjustable slots to take various reel diameters. No screws, washers or cotter pins to remove—simply raise up the roller and slide into the slot required.
(8) Will take any reel up to 30" in width. For larger reels, use two reel rollers and bolt together end to end.
(9) Can be used in the warehouse, on the job or truck.

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J. G. POMEROY, 1004 East 4th St., Los Angeles 13, Calif.
W. W. WHEAT & SON, 560 1st Ave., So., Seattle 4, Wash.

Aerial Cable (819)

For use in areas having shade trees, a heavily insulated self-supporting aerial cable has been developed by American Steel & Wire Co. The conductors within the cable are individually insulated with high-quality rubber, then jacketed with semi-conducting neoprene, which offers high abrasion resistance, as well as protection against sun, wind and ice. One, two or three insulated conductors are then cabled around a steel messenger strand of sufficient strength to support the cable. To provide enough slack for installation, the direction of the cabled conductors around the messenger is reversed every 12 to 20 ft. According to the manufacturer, in cases where a falling tree pulls down the entire pole line, cables may be operated as long as the insulation remains intact.

Street Lighting Unit (820)

A new Form 45H7 wet-process porcelain insulator for series street lighting luminaires has been announced by General Electric. This insulator features a strengthened lip, integral porcelain tie-lugs and an accurately positioned light center. It is recommended for use with high-voltage aerial wiring. With the Form 72 for duplex cable, and the Form 45H7, G-E's line of wet-process porcelain insulators includes two standard designs suitable for all types of mounting, selection of reflectors or reflector-glassware combinations. The insulator is interchangeable with older designs.

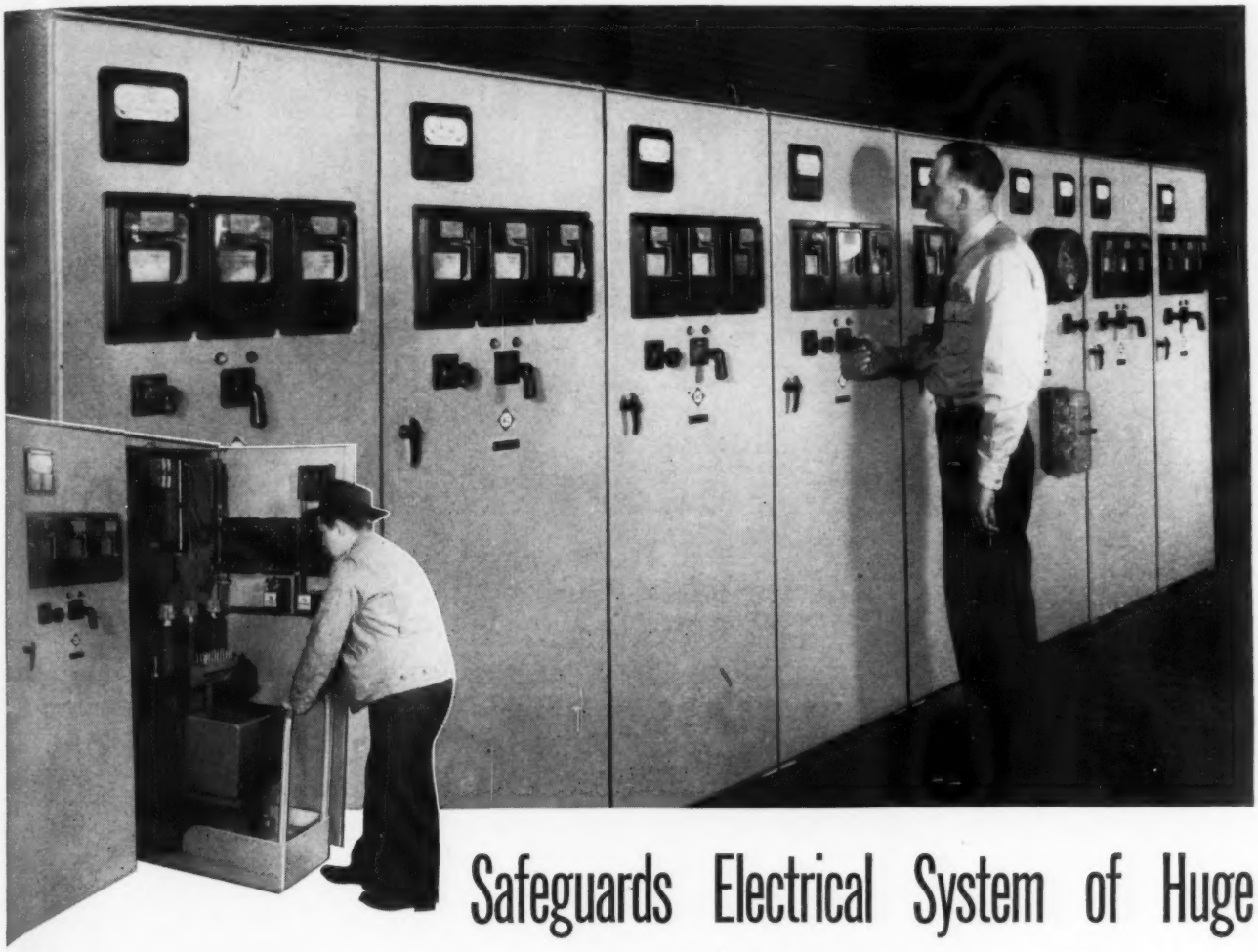
Electrical Tape (821)

A tape combining the electrical insulation of rubber tape and the mechanical protection of friction tape in a single wrapping operation has been announced by Minnesota Mining & Mfg. Co. The tape has a Vinyl plastic backing; is weather resistant; has a dielectric strength of 1,000 volts per mil. It is thinner than either rubber or friction tape. Elongation before break is said to be more than 100%. Thicknesses range from 7 to 12 mils. Colors are yellow, white and black.

Safety Belt (822)

Buckingham Mfg. Co. is making a tree surgeon's safety belt in two models—one with leather-lined saddle and back; one without lining. These belts are made of 4-ply cotton webbing, moisture proofed and mildew treated, securely stitched and riveted. Saddle is fitted with forged D-rings for sling; belt is equipped with both a ring and snap fastener for carrying tools and accessories.

METAL-CLAD SWITCHGEAR ON GUARD!



Unit is easily accessible and removable for visual inspection.

Safeguards Electrical System of Huge Midwest Manufacturing Plant

RELIABLE, POSITIVE protection for this progressive industrial plant is provided by *Ruptair* magnetic air circuit breakers. These units *efficiently* control the output of 6000 kva, 4160 volts, three phase, 60 cycle transformers.

There's safety to operating personnel, too. When the circuit breaker is lowered for inspection, contacts automatically disconnect. Vital buses are completely enclosed in separate compartments. Yes, it's modern *metal-clad* switchgear on which you can depend . . . for fast, sure interruption and permanent, trouble-free duty.

* * *

Allis-Chalmers first introduced modern metal-clad switchgear to the U.S. Today, A-C builds a complete line of switchgear for all applications. Bring your problems to experts . . . call your nearest A-C office or write to ALLIS-CHALMERS, MILWAUKEE 1, WIS.

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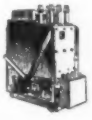
Allis-Chalmers Builds all four Types of Circuit Breakers

AIR BLAST available in interrupting capacities from 250,000 kva to 500,000 kva.

MAGNETIC AIR. A-C trademark *Ruptair*. Capacities: 50,000 to 250,000 kva.



OIL — A-C trademark *Ruptor*. Interrupting. Capacities: 50,000 to 500,000 kva.

LOW VOLTAGE—Metal enclosed dead front; 25,000-50,000 A. I. C., 600 v a-c max

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power-full production muscles
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L.V.D. BUSWAYS
L. V. D. means low voltage drop... full power delivery right to the end of the line. Fully prefabricated sections and installation accessories . . . carried in stock . . . mean fast, low-cost installation without special engineering. Interconnects with Trumbull Flex-a-Power systems for secondary distribution to point of load. Do no plant wiring until you have investigated this better, modern method.
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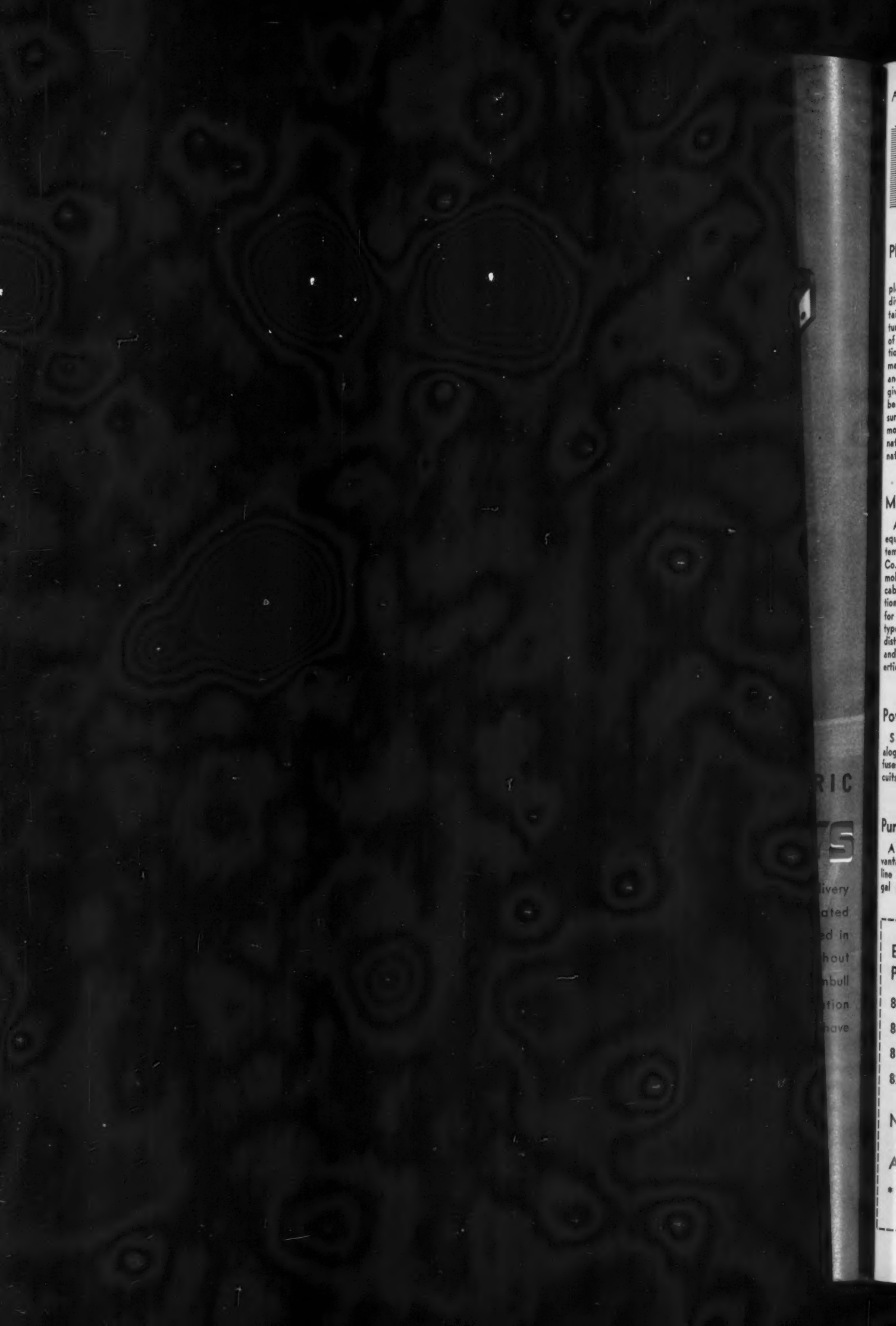

BULLETINS ETC.

Plastics (823)

A 64-page booklet on Textolite laminated plastics has been published by the plastics division of the General Electric Co. It contains complete information on the manufacture, application engineering and properties of all types of Textolite laminated applications; lists 44 different grades of the sheet material along with their electrical, physical and mechanical properties. Other sections give information on Textolite tubes and rods, bearing materials, silent gears, decorative surfaces, translucent sheets, name-plates, molded-laminated plastics, low-pressure laminated plastics, methods and fabricating laminates and ordering instructions.

Mole Line Equipment (824)

A 104-page technical catalog on mole line equipment for underground distribution systems is available from Burndy Engineering Co. Inc. In addition to sections devoted to moles, Hycrabs, limiters and other types of cable connectors, Catalog Z47 features a section which shows graphically the method used for installing mole line equipment on all types of cables normally used for underground distribution. Also contains circuit diagrams and tables listing cable installation properties.

Power Fuses (825)

S & C Electric Co. has issued a new catalog section on its "SMD" drop-out power fuses and mountings for application on circuits of 92,000 to 138,000 volts.

Pumps (826)

A bulletin telling of the operating advantages and construction features of its new line of "Pedrifugal" pedestal-type centrifugal pumps has been released by Allis-Chalmers Mfg. Co. According to the bulletin, five sizes of this pump handle all general pumping requirements up to 500 g.p.m. and up to 100-ft. head. Also possible, is an unlimited range of intermediate capacities and heads.

Signal Equipment (827)

The Autocall Co. announces the release of a new booklet covering its line of electrical signal and control equipment for public utility and industrial power plants. The booklet illustrates annunciators in various sizes and styles, audible signals, including horns, whistles, chimes, and vibrating and single-stroke bells; plus the Autocall central sending station which, in addition to its use in notifying individual of phone calls, emergencies, etc., will automatically signal start and stop work and rest periods.

Infrared Catalog (828)

Wuelker Infra Red and Lighting Co. has issued a new catalog and price list of its heating and drying units.

Controllers (829)

Bristol Co. has published a 12-page bulletin, No. C305, on its new line of Model C500 impulse-sequence time cycle controllers. The bulletin gives detailed information about this newly developed model for tire presses, plastic molds, and general process operations.

Replacement Transformers (830)

Crest Transformer Corp. has released a new catalog of replacement transformers. The company produces transformers and component parts for the radio industry, neon transformers for neon lighting, and power transformers for electrical fence control.

ELECTRICAL WEST, 68 Post St., San Francisco 4, California
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Name..... Company*..... Title*.....

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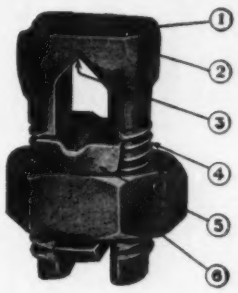
* Please include your company's name and your position, as we cannot ask manufacturers to furnish literature unless you do.



Nutype Matthews Conductor Connectors

Reasons

WHY THEY ARE BETTER:

(1). Broad, strong head, with size plainly marked. Sides of head have flat surface so wrench or pliers can grip tightly.

(2). 100% Pure Copper, Cold forged bolt of ample strength for all purposes. High copper content prevents corrosion and season cracking. All edges are rounded.

(3). Modified "V" shaped groove, holds wires in three point contact and prevents rocking or looseness.

(4). 85% plus, full thread, die stamped, insures full engagement in nut, hence high strength connectors. No sharp edges.

(5). "V" groove clamping jaw of cold forged, 100% pure copper. Flanged sides give greater bearing surface on nut, hence greater strength.

(6). 97% copper content, hard metal nut—strong as steel. Full thread engagement with bolt.

(7). Made in 9 sizes—6 sizes of cold forged copper as illustrated and 4 sizes of machined high copper content alloy.

Send for bulletin and free samples and convince yourself of their superiority.

With Nut Retainer

W. N. MATTHEWS CORPORATION
ST. LOUIS, U. S. A.

ELECTRA'S HUSBAND

WHAT, NO ENSEMBLE?

ELECTRA'S HUSBAND was resting his mind with a book of the "escape literature" type. He was fast coming to grips with a suave slayer known as "The Mysterious Marauder" when Electra broke the spell:

"Why is it that we don't have any two electrical appliances with the same trade name—or hardly any?"

"Shocking," declared the head of the house, referring principally to the Marauder's battery-activated gadget which softened his victims for the kill.

"Oh, it's not that bad," Electra demurred. "Or is it? . . . Look, we have a dozen or more pieces of electrical equipment around the house, each of them bought at different shops, from different salesmen and manufactured by different factories. Why should that be?"

"You ought to know . . . I'd guess it's because when The Iceman Cameth you took ice; and when the phone rangeth bringing news that the Philco you ordered a year ago had arrived, you had it delivered, and The Iceman Cometh no more."

"Not funny, McGee." Electra put on her best pout, which is cute after the fashion of a thunderhead. "If you're not interested, we'll say no more about it."

Realizing that he had committed a tactical error, her husband reluctantly laid aside the Marauder until such time as Electra should finish saying no more about it.

Mollified, Electra proposed: "Let's take inventory. You jot down the names and types of items as I call them off. . . . Ready? . . .

"Philco refrigerator; Maytag washing machine; Hoover vacuum cleaner; Singer electric sewing machine; Hamilton Beach mixer; Proctor smoothing iron; Corey coffeemaker; Zenith radio; Manning-Bowman heating pad; Telechron clock; Universal curling iron. . . . See what I mean? Why didn't the shop from which I bought the mixer try to sell me something else? Maybe I didn't need any other electrical item at the moment, but the salesman could have tried, and then, later, I might remember to patronize him. Don't any manufacturers of electrical equipment put out more than one line?"

"Hold everything." Taking advantage of Electra's pause for breath, her husband finished taking inventory notes and spoke, simultaneously. "Of course manufacturers have more than one trade line. . . . Proctor makes electric toasters, irons, roasters—"

"Oh, goody. You can get me an electric roaster for my birthday."

"Please don't interrupt. . . . Hamilton Beach makes vacuum cleaners and sewing machine motors—"

"There! That illustrates what I've been getting at. When I bought my mixer I would have been a soft touch for a vacuum cleaner but the salesman didn't offer anything else. Who makes electric cooking ranges?"

"Why, a number of manufacturers do. General Electric, Universal and Westinghouse supply complete electrical lines through retail outlets. If you go to one of their shops to make a purchase—"

"Now that you've brought up the subject, I really need an electric range," Electra broke in eagerly.

"I didn't bring it up; and besides, what's the matter with the new gas range we bought last year when there were no electric ranges on the market?"

"It's not electric, that's what's the matter with it; besides, I couldn't get a thermostat at the time, and now they tell me one can't be installed on that model."

Having booby-trapped himself, Electra's husband struggled to emerge with minimum damage to himself. He talked fast and sternly:

"I thought we were discussing why manufacturers don't push their full line of goods. . . . They do, to the best of their ability; but one difficulty, I guess, is that retail dealers mostly want only one or two appliances to round out their stocks. The same applies to department stores; the buyer will take on a franchise for something he lacks, such as a vacuum cleaner, a washing machine, a radio—"

"—or electric ranges," Electra demurely supplied an item her husband had deliberately by-passed. Then with feminine adroitness she changed the subject: "How far are you in *The Mysterious Marauder*?"

"Page 163."

"Silly! I mean have you gotten to the place where the butler is murdered—to eliminate him as a suspect?"

"Not yet. I'm just—"

"Well, let's see where you are."

He passed the book over to her, carefully dog-earing his page. Electra leaved through it eagerly, found her place and read on. Her husband sighed after opening his mouth several times and then thinking better of the impulse to demand the return of the Marauder. . . . Better let sleeping dogs lie; and the same philosophy applies to reading women.

Heading for the refrigerator and a bottle of something cold, he wondered:

Did Electra put on that act about electrical appliances as an approach to the electric range she wanted? Or was it a strategy to get the book he had slyly filched from her chair while she was doing the dinner dishes—or both? In either case, she had twice put the bite on him, posed a merchandising problem for someone else to solve and was now free to contemplate *The Mysterious Marauder* with unworried leisure.

NEXT day, thinking more of this ensemble idea, and how much has been said about it, yet so little accomplished, I wondered thus: In the already built and lived-in home, as with the case of wiring, not much can be done about it. People will buy appliances piecemeal, as they need or are taught to want them or as their old ones wear out. And maybe that's a break for the individual dealer. If the package idea takes hold, as it may well do on kitchens, then it may well be that a whole kitchen with appliances of one make may be bought at once.

Just a minute now, Electra's provider may have walked into a trap. Before he knew it he had been moved up to the new electric range. Was it a new *kitchen* she was after?

a NEW TOOL
for the modern farm . . .

FARM WELDER

Here's quick handy repair "insurance" for the modern farmer, experienced in welding or not. The G.E. Farm Welder is built *specifically* for welding on the farm, is small, compact and easy to learn to use.

GENERAL ELECTRIC

Reliable—Easy to Use
Portable—Economical to Operate

General Electric's NEW Farm Welder is an Electric Arc Welder designed specifically for Farm use—makes better, lasting repairs without loss of valuable time right on the farm. This is a true arc welder, with many of the features found in G.E. industrial-type welders, but small in size and built especially for welding *on the farm*. Compactly portable, sturdy, and providing the greatest possible protection for both the operator and the equipment itself, this NEW Farm Welder is an invaluable tool for the present-day farm. Available in two sizes (130- and 180-amp), it comes complete with electrodes and accessories and may be used on any farm connected to a suitable power line, without interference with other electric equipment.

ACCESSORIES and ELECTRODES

Included in the purchase price of the welder is 15 feet of electrode cable, 10 feet of ground cable plus clamp, 10 feet of primary cable complete and a wall receptacle. In the accessory package are: an instruction manual, hand shield, slag hammer, scratch brush, welder's gloves, carbon arc starter plus electrodes in assorted sizes for various applications.

GENERAL ELECTRIC SUPPLY CORPORATION

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BUS DUCT

an important forward step for Federal...and for you!

FOR FEDERAL... because it means a significant expansion of the Federal line of control and distribution equipment.

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FEDERAL NOARK BUS DUCT... THE MOST MODERN METHOD OF SECONDARY POWER DISTRIBUTION

FLEXIBILITY—secondary power source immediately adjacent to machinery, ready to plug in; permits rearrangement of machines with minimum production loss.

DEPENDABILITY—reduces hazards of costly breakdown and service disruption; cuts down maintenance costs and production delays. Underwriters' approved, of course.

ECONOMY—power outlets provided at 1-foot centers, making possible expansion of plant facilities at lower cost.

FEDERAL NOARK BUS DUCT FEATURES:

Four-Channel Strength—each member, sides, top and bottom is a rigid channel; rugged bus bar insulators mounted on 12" centers for greater electrical safety and mechanical strength • **Insulated Plug-In Openings** provide complete safety in applying or removing plug-ins • **Easy installation** by means of adjustable hangers • **Silver-Plated** contacts at bolted connections.

Descriptive literature on request; consult your Federal District Office about your Bus Duct requirements now.

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AUGUST 1947 Vol. 99, No. 2

ELECTRICAL WEST

TEAMWORK PAYS

From a talk before the Northwest Electric Light & Power Association at Seattle by the manager of the Valley Electrical Supply Company of Fresno, California:

K. L. Hampton

THERE is an old saying that if you don't believe in cooperation watch what happens to a wagon when a wheel comes off. Be that as it may, there exist in this industry of ours a lot of men of specialized knowledge. Yet if any group of you want your eyes opened and your ears to burn, sit for a few minutes and listen to a bunch of manufacturers or jobbers tell about how many dumbbells have opened up in the retail business where one good man was before; or listen to any group of dealers talk about too many jobbers; or any bunch of utility men talk about the unfilled delivery schedules of the manufacturers. You will wonder whether this industry does not revolve around one wise man and some unfortunate misfits, or perhaps is a loosely organized cutthroat society.

Anyone Can Tear Down

I saw them tearing a building down,
A group of men in a busy town.
With a ho-heave-ho and a lusty yell
They swung a beam and a side wall fell.

I asked a foreman, "Are these men skilled
As the men you would hire if you had to build?"
He laughed and said, "No, indeed.
Just common labor is all I need.
I can easily wreck in a day or two
What builders have taken a year to do."

This electrical industry stands as a tribute to *builders*, men of vision. It is we who must look to the use we make of the tools they have left us as a heritage from them. They built not only with the mechanical tools of the engineer, but with the wisdom of organization—teamwork, if you please.

Is this tearing down talk about our neighbors, yea, more than neighbors—our partners — helping us to build ahead?

Ben Franklin many years ago effectively used the argument that a chain is only as strong as its weakest link. He illustrated the strength that lies in unity of effort by showing how much harder it is to break a bunch of twigs than to break each one of them separately. I submit to you that our industry today is beset from without with enough forces bent upon licking her to make it mandatory, yes, to make it imperative, that we band together in group action. I submit further that such group action cannot be expected one from the other unless it is nurtured in the cradle of understanding.

We have in this electrical industry two great manufacturing groups—the electric utilities and the equipment and appliance manufacturers. The electric utilities manufacture, transport and distribute their product direct to the customer. To do this, they employ half of the people engaged in this business. For the use of their product, however, they are completely dependent upon that other great manufacturing group, those factories which manufacture equipment and appliances.

Both, then, are dependent upon the rest of the industry—that great group of agents, jobbers, wholesalers and distributors who act to transport, warehouse and sell the equipment and appliances.

All are dependent on the two great retail groups—the electrical contractor who wires the job and the retailer who sells the equipment. Revenue accrues to the utility solely through the equipment, apparatus and appliances which move through the merchandising channels of distribution.

The people in all these groups are busy men whose greatest concern is doing the task at hand, running their own business whatever it may be, a retail store or a jobbing business, a factory or a repair shop. They are busy making a living in their chosen work.

Almost the only time they think of any other branch of the industry is when they think of it in relation to a *problem* that has arisen in their business. Since it is a problem, it is difficult to solve. Being difficult to solve, it takes effort and for that extra effort someone must take the blame. So heat, friction, lack of understanding results in that person or firm's relations with whatever branch of the industry is involved.

Most of the critical talk between industry groups in the electrical business comes either through ignorance or poor personal relations. Both can be and should be corrected.

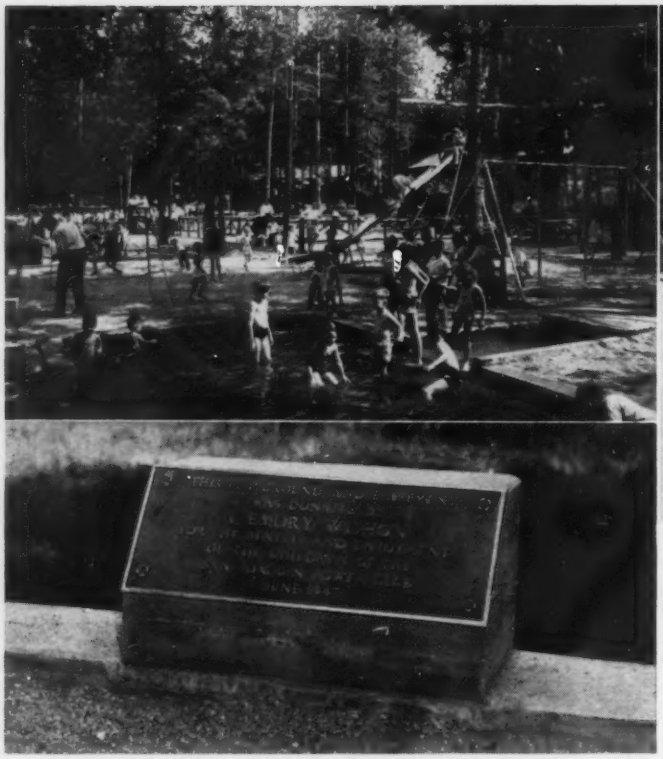
The seviceman is most conscious of his manufacturer when the manufacturer fails to send him the part he needs for Mrs. Jones' range. One delay of three weeks on one item offsets years of good service.

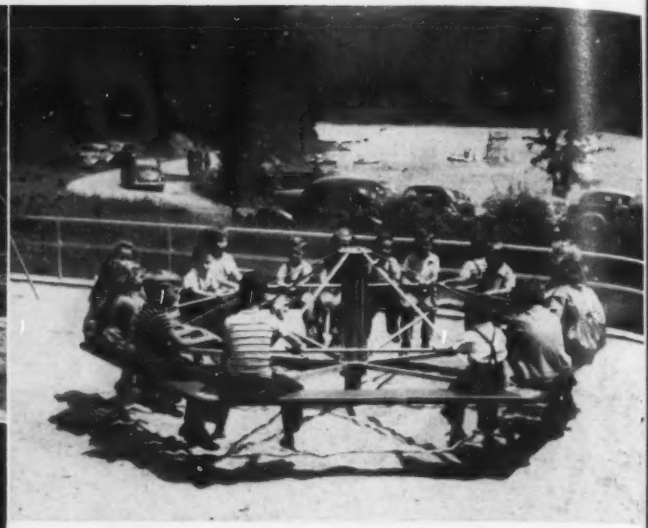
The jobber is reminded most of his dealer when that dealer fails to pay his bill.

The utility becomes most conscious of the electrical contractor when the contractor sets the transformer vault or the meter loop at a location that cannot possibly be reached with normal service—and so it goes.

That is what is meant by friction—heat—being conscious of the other fellow only when a problem is involved. This can only be overcome by closer working relations, better understanding of the other fellow's problem. Just as our interests have one focal point, the customer's property—and after all that is the only place where a profit accrues to anyone—so the industry has one common factor. That factor is *people*, our employees—and most of us are employees.

Millions of us Americans are dependent on the electrical industry for our livelihood. No matter what your job in this industry is, you have a dollars-and-cents stake in the increased use of electricity. We all have a common interest—to increase the use of electricity.





Provision of recreational facilities for employees and their families on utility company grounds is a practice of many Western power companies. Up at Bass Lake, a power reservoir in the Sierra Nevada near Yosemite, this children's playground has been donated by A. Emory Wishon, executive vice-president of Pacific Gas and Electric Co., as part of a recreational project administered by the San Joaquin Power Club of that organization

The basic job to be accomplished is to point out to every one of the million employees of the electrical industry that he gets a share in every dollar spent for electrical goods and services.

There are about a million people employed in our industry and most of them have families, which means there are probably three million people dependent upon the industry for their living. Of these, only a few are trained to come into personal contact with the public. Yet these other people—the office workers, the factory hands, the warehousemen, the engineers, the inspectors, the executives—these people, after working hours, circulate through their communities making contacts with friends and neighbors, merchants and local business people. What our industry has failed to realize is that employees, properly informed, would comprise a mighty sales force, influencing public acceptance of the products we have to sell.

This program today is concerned with that problem—of placing information in the hands of these individual men and women in such a way that they will realize that essentially their future depends upon the increased use of electricity.

Their stake is relatively as great as yours. Their future, their job security depends upon it, and I believe they will do what they can to promote its use, if we show them how to do it. The problem is to make them understand that for their own sakes they should become part of a gigantic sales force whose sole objective is to sell the increased use of electricity.

All of us should train ourselves to think in terms of how we can help our industry do a better job. How can we do our part in helping the electric utility do a better job? How can we do our part in helping the electrical contractor or the manufacturer or the dealer do a better job? First, we must know the other fellow's problems; and second, we must protect him from unwarranted criticism and advise him correctly on any activity in our field.

If we are to criticize at all, then the criticism should be done personally and in private where it will do good.

In science, we have from the Greeks the law of the fulcrum. It was Archimedes who is quoted as having said "Give me a long enough lever and a suitable fulcrum and I will move the world."

In late years, it was Joseph Conrad who said "Give me the right word and the right accent and I will move the world."

Both may be true, but as true as either is the statement that, banded together in one group, this electrical industry of ours is unconquerable. Give us a problem upon which we can bring the united attention of our utility people and manufacturing talent, our jobbers know-how in distribution, the financing and salesmanship know-how of our retailers and we will lick it. Together, we can truly say that tonight we do the difficult, tomorrow we will do the impossible, but divided we are weak and fair game for those who stand against us.

"Live and let live" is more than a saying. It's the foundation upon which industries are built, the foundation upon which customers are served. It is the watchword between groups.

To work together successfully calls for faith, vision and perspiration. To work together we must understand the other fellow's problems.

Peculiarly, the business that succeeds in good times and bad is that well-managed business that deals fairly with its customers. The industry that grows is that industry that teams up as one to solve its problems. We have a heritage in this electrical industry of research, engineering development, vision, good management and salesmanship. It is the springboard from which we go ahead.

Cooperation is no longer a sentiment to us in the electrical business. It has now become an economic necessity. There can be no coperation without understanding. Those things which lead the other fellow to fear us, to fear the encroachment of one group upon the other must be eliminated.

We succeed best when we serve best. We live best when the other fellow also prospers. If we are to live securely and prosper, we must so conduct our affairs that others, too, may live. Faith, in yourself is not enough you must have faith in your industry and understanding and belief in the integrity of your fellow men.

LINEMEN THE TRAINEE WAY

Early in the spring of 1946 it became apparent to officials of Puget Sound Power & Light Co. that a considerable number of added journeymen linemen would be needed to take care of the company's scheduled expansion. Hiring of linemen in other sections of the country had proved largely unavailing, so it became necessary to train men to become journeymen linemen.

Under the direction of the company's personnel officer, C. W. Sherman, a committee was formed to study the over-all problem and to bring forth a workable solution. The result of the committee's activities was an outline for an intensive 13-week training course designed to produce well-trained and qualified linemen in the shortest possible time. An electrical engineer, with 15 years of company experience in both the divisions and the general engineering department, was appointed as school coordinator on a full-time basis to supervise, instruct and handle personally the classroom work in electrical and mechanical theory.

A site was selected at the Canal substation in Seattle with classroom space provided within the substation. Nearly a square city block back of the substation provided the necessary work space for the erection of the practice pole lines.

Selection for this first training school was made from the 13 apprentice linemen in the six geographic divisions of the company. The training program took up the months of May, June and July. Only one of the original 13 was forced to drop out, due to climbing difficulties.

Specialized instruction was given by 23 different company employees, each of whom was considered a specialist in one particular phase of the lineman's job. Subjects such as pole framing, steel cable-splicing, transformers, tree cutting, compression splicing, and theory, were handled by these instructors in periods ranging from one-half day to a whole week of instruction and practice.

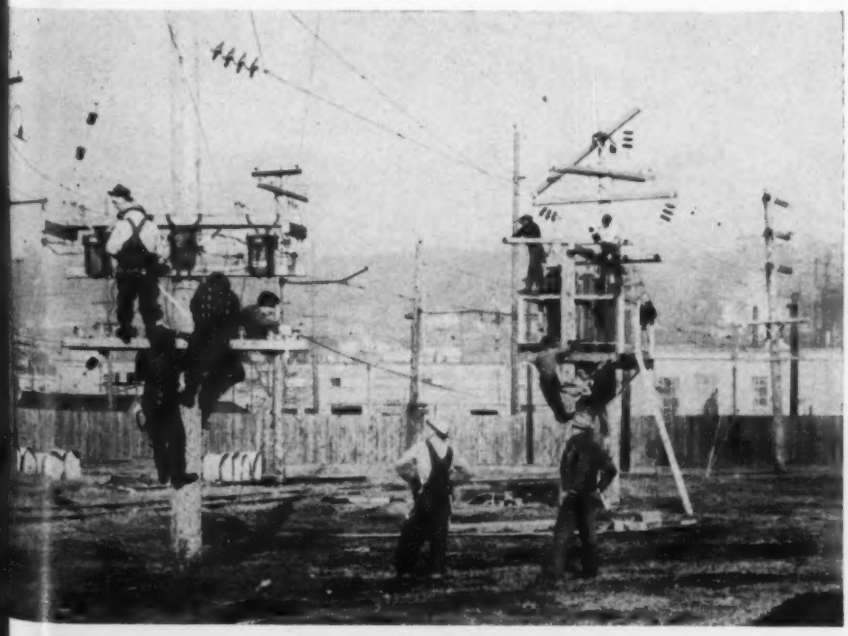
During the thirteenth week written and field examinations were given by the company and also by the union. Of the twelve men completing this particular class, all but one were certified as journeymen linemen within 30 days of their return to the heavy crew from which they came.

When the second training school got under way last fall, the training site was moved to the grounds of the Georgetown storeroom, where more space was available for a practice yard. Twenty-two men were selected for this school, and the class was comprised of apprentice linemen, groundmen, and head groundmen from the six company divisions. Because the vast majority of these men had considerably less experience than those in the previous school, the object of the second school was to turn the men out as fifth period apprentices, with the exception of two men with a longer work record who, it was felt, could qualify for a higher rating at the end of the training period. The provision was stipulated that as fifth period apprentices these men, upon completion of the training period, could be formed into heavy line construction crews, but only for new cold construction work, and they would receive linemen's rate of pay while performing this work.

In the second class, as was previously the case, climbing instruction was given for several days at the outset, and training films on the art of climbing were shown to the class.

On three days a week throughout the entire program, one hour was devoted exclusively to safety training, including a company course in pole-top resuscitation. The only time hot-line work was involved in any way was when one of the regular line crews ran in live primary and secondary wires for the purpose of testing out transformer connections which the apprentice trainees had made.

During the last week all 21 men successfully passed the examination on safety practices and also the written and field journeyman lineman's examination. Upon return to the several division headquarters, four new heavy construction crews were formed. More than the usual amount of personal initiative was evidenced, and the company feels that these embryonic linemen will in time become top-flight, full-fledged journeymen linemen in every sense of the word.



MORE

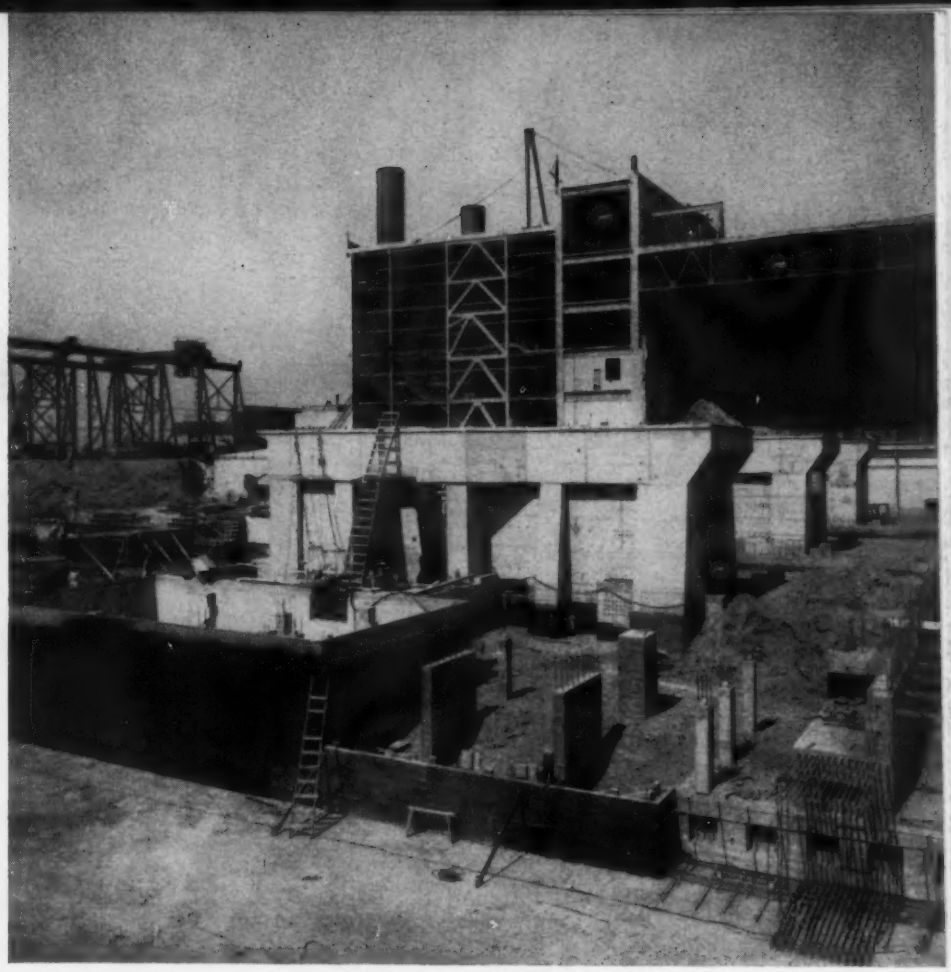
Photo by Doug White

REDONDO steam plant of Southern California Edison Co. will have two 60,000-kw. units initially; two more later for a total of 240,000 kw. Units are essentially ASME-AIEE standard. Pressure is 875 psi., temperature 900°. Feature of the plant is provision for reversing flow of ocean condensing water every two hours to prevent sea growths in the 10-ft. concrete conduits. First two units are scheduled for late this year

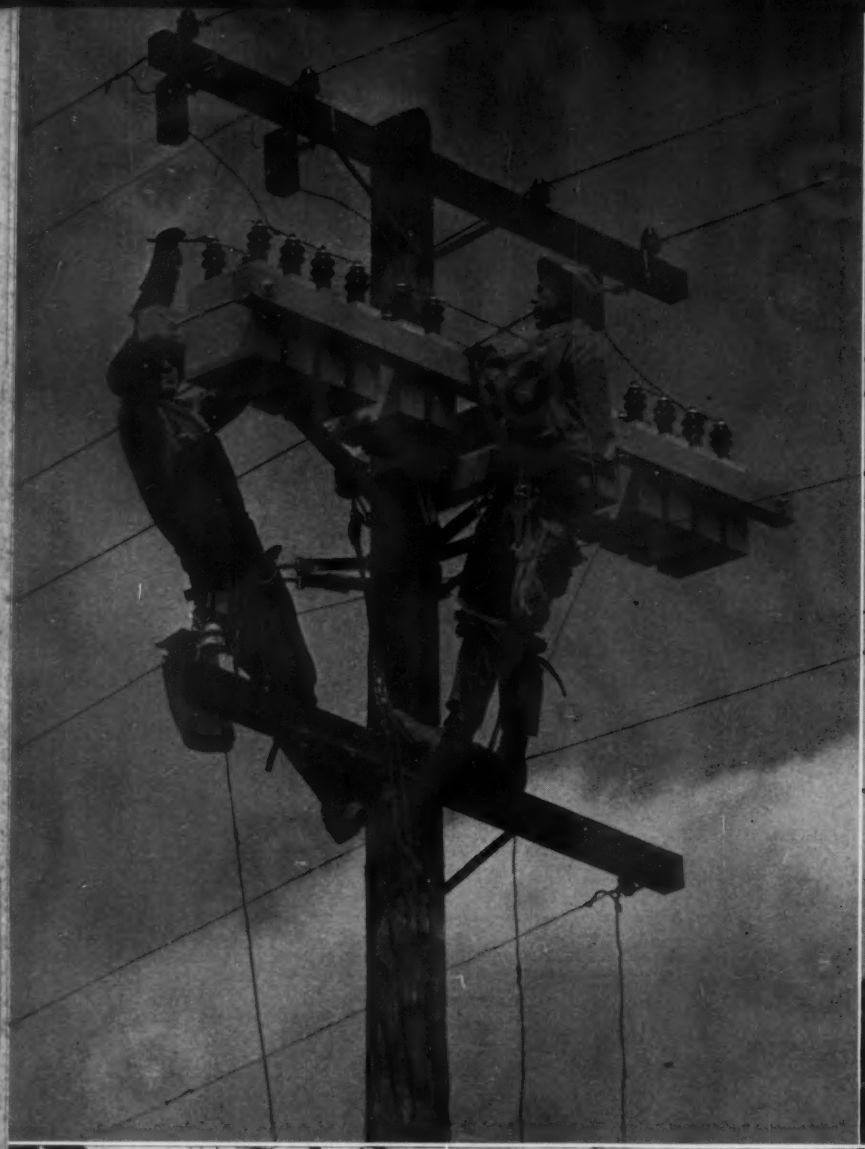
STATION P, with two 100,000-kw. units is another major addition to PG and E steam generation. The plant will be housed in an addition to an old Great Western station at Hunter's Point, San Francisco. Estimated cost is $23,000,000. Station P will be another high-pressure plant with 1,300 psi. and 950°. Completion of the plant is set for latter part of year 1948

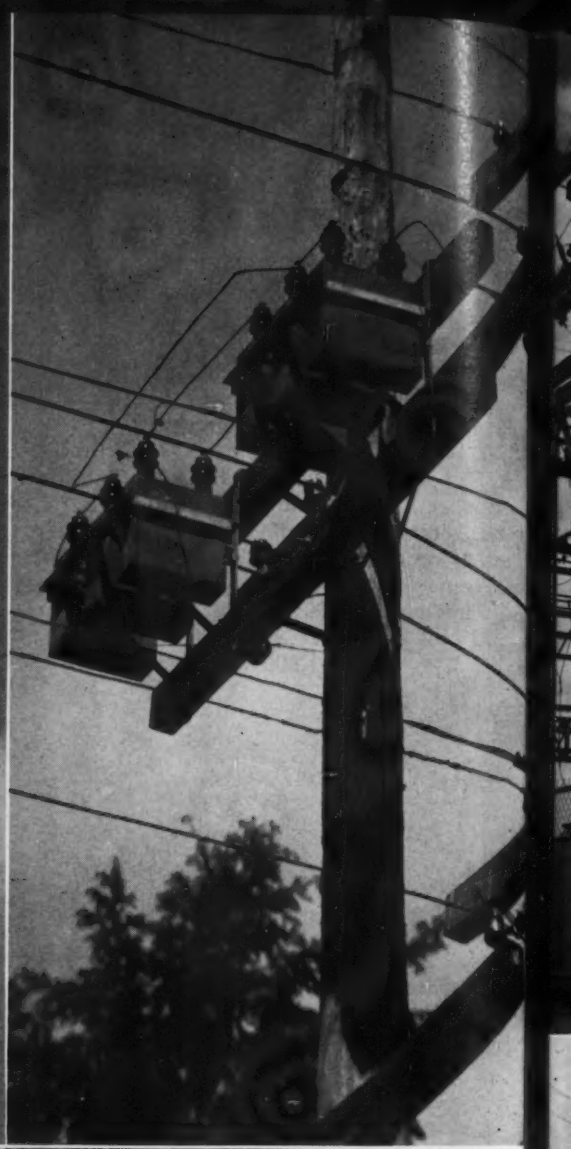
STEAM

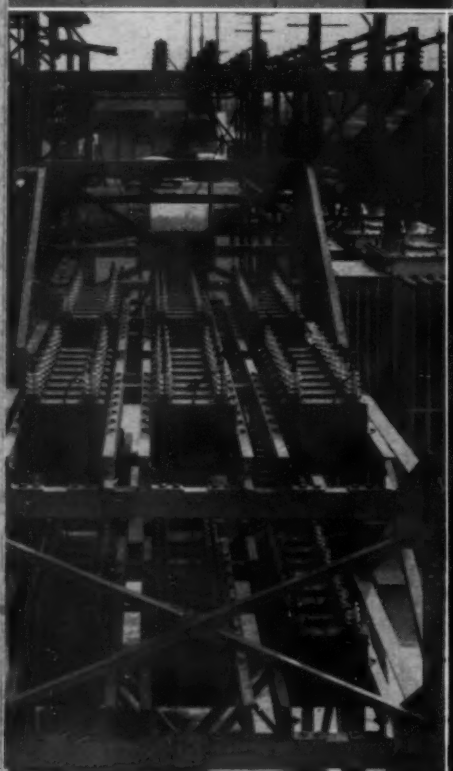
HARBOR steam plant of the Los Angeles Department of Water & Power is to have another 65,000-kw. unit to be in operation in November of this year. Three 75,000-kw. machines are on order. First of these will come in September 1948 with others to follow shortly, completing this plant to its ultimate of 335,000 kw. Pressure for all units is 850 psi., temperature 900°. Units 1 and 2 will operate at 3,600 r.p.m.; 3, 4, and 5, 1,800 r.p.m.



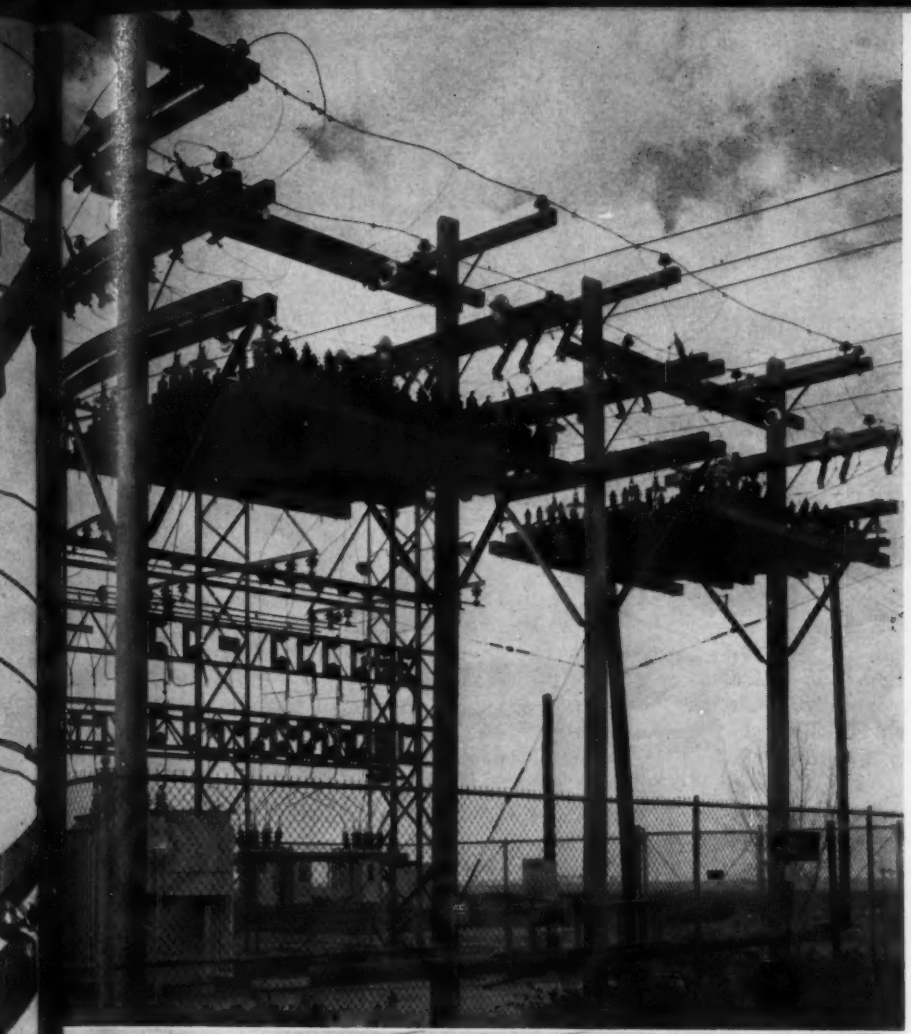
KERN is one of two new steam plants under construction by Pacific Gas and Electric Co. Plant will have a 60,000-kw. unit to be in operation by June 1948. A 100,000-kw. unit now on order will come in later. Total cost is estimated at $23,890,000. Steam pressure will be 1,350 psi., temperature 925°. Oil is first to be burned but gas is provided for when available.

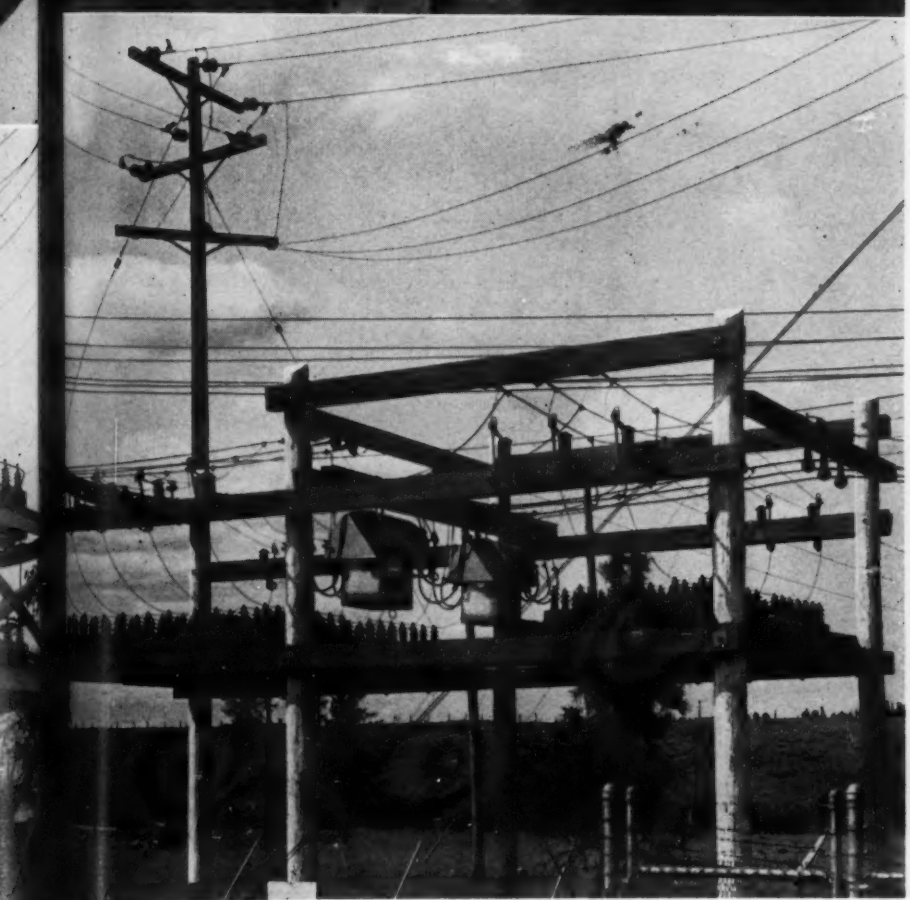






Capacitors

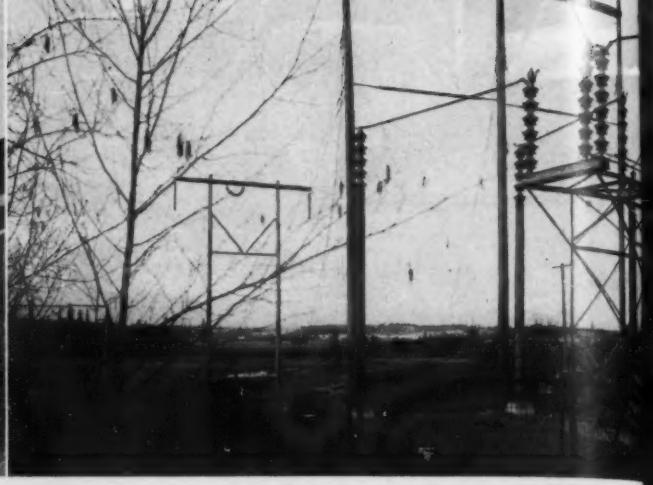




Capacitors to be added to distribution lines of West Coast utilities will total approximately 250,000 kva. during 1947. Several mounting practices are shown by the accompanying photographs. Where capacitors are installed out on primary feeders, Washington Water Power Co. mounts 12 units totaling 180 kva. between a set of properly spaced double arms as shown. This eliminates the conventional iron hanger brackets used by many utilities.

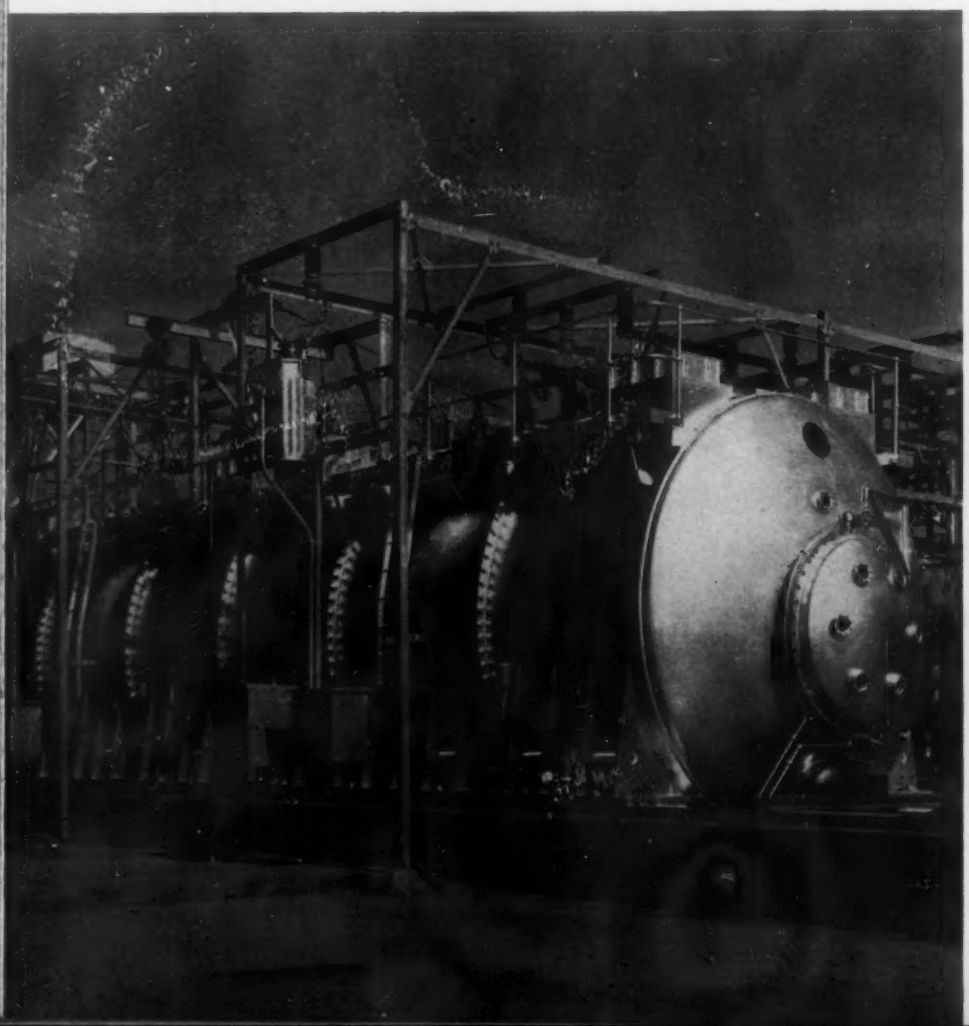
To get as much capacitance on systems as rapidly as possible most utilities install good-size banks at distribution substations. Installations of three power companies are shown. The two pole-mounted jobs are PG and E and Washington Water Power Co. The steel rack installation is Southern California Edison's mounting practice and has worked out very advantageously. The angle iron rack with suitable rails for supporting units, is fabricated in the shop. It is made in sections that will accommodate 48 15-kva. units each. Multiples are added as desired. The two-section rack shown mounts 96 units, or 1,440 kva. Capacitor banks are connected to the auxiliary bus and protected, and switched where necessary, by the bus tie oil circuit breaker. Scarcity of suitable fuses during the war led Edison to tie capacitors in solid. Satisfactory operating experience during the past three years, leads engineers to doubt the necessity for unit fusing. Switching capacitors in and out to prevent excessive voltage rise has not yet become a serious problem with most utilities. So far, Edison switches manually with the bus tie breaker. A patrolman cuts them out about ten at night and back in around eight in the morning.

The whole subject of capacitors, location, mounting and switching is a current live topic among engineers.

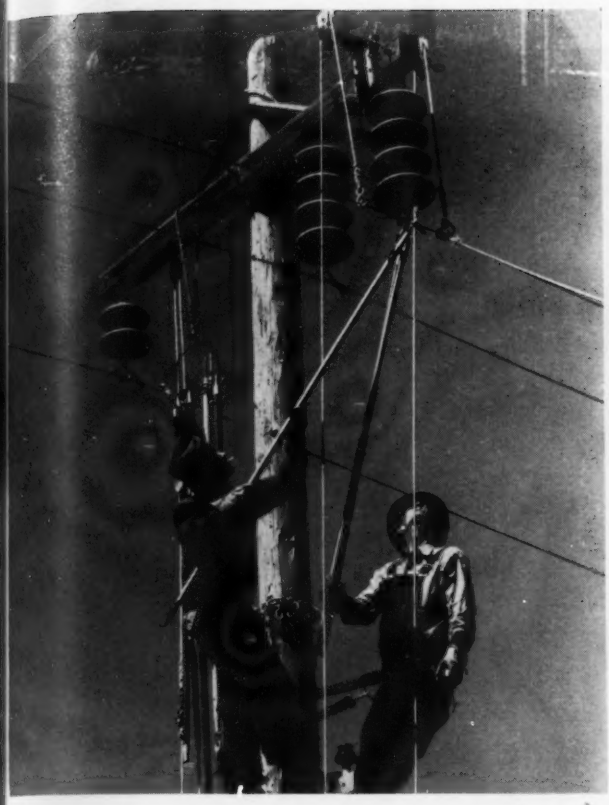


PG and E's new Moraga substation to be fed by a double-circuit 220-kv. line from Vaca-Dixon will supply additional power into Oakland area over eight 110-kv. lines. The station will have two transformer banks of 90,000 kva. each, or 180,000 kva. between the 220- and the 110-kv. systems. Two outdoor-type synchronous condensers of 35,000 kva. each are being provided. An interesting feature of the job is a new Carquinez Strait 220-kv. crossing span 4,805 ft. in length. Completion of Moraga is scheduled for sometime this fall

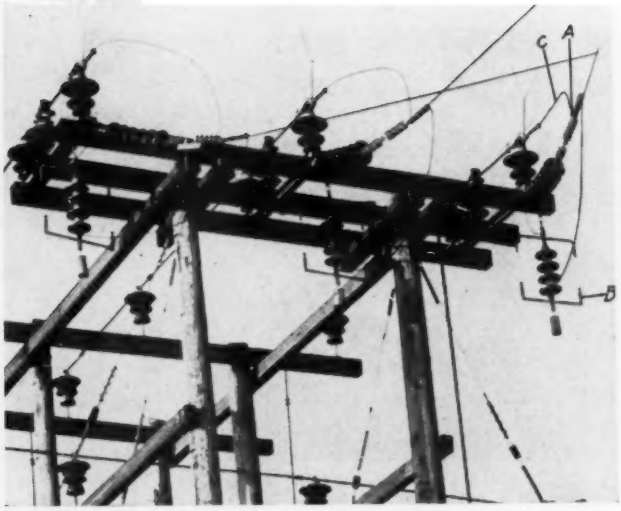
Canadian Border switching station of Bonneville Power Administration will be hotted up in late July or early August. Seasonal or surplus power will be interchanged with B. C. Electric Railway Co. BPA built a 230-kv. line from Arlington to Blaine and B C. Electric Railway from Vancouver to Border. Although authorized as a war project, the line will be particularly useful in power interchange over the border when the B. C. utility brings in the first 50,000-kw. unit in its 10-unit Bridge River hydro project scheduled for early in 1949



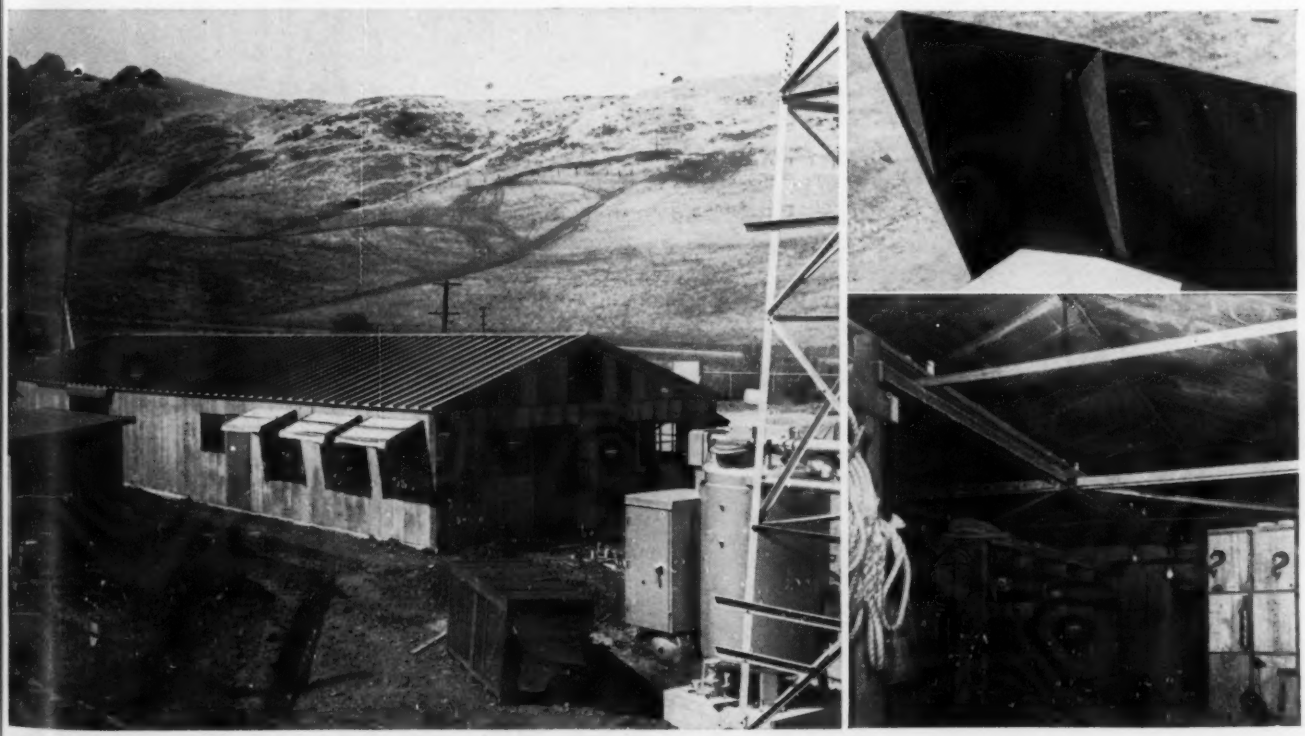
Amplidyne field control on 60,000-kva. frequency changer at new Highgrove 220-kv. substation of Southern Calif. Edison Co. provides high-speed response and better voltage regulation. Amplidyne was first used on a 50,000-kva. synchronous condenser at Edison's Laguna Bell substation nearly two years ago. Application was so successful that Highgrove followed and the same or similar control will be used on generators at Redondo and Long Beach steam plants. The Amplidyne is a small d-c generator with main field and one or more control fields. It acts as an amplifier much as a radio tube wherein a small change in one quantity produces a very large change in another. When applied to shunt field of rotating machines, voltage regulation is automatically maintained within very close limits and response to any system changes is very rapid



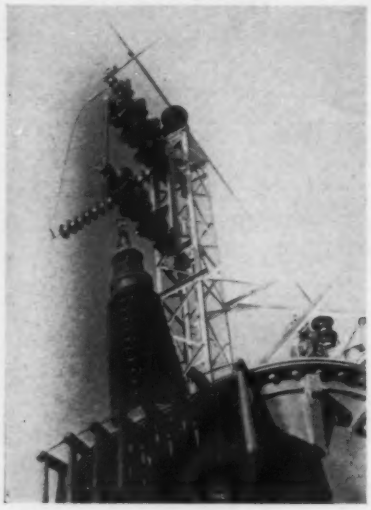
Hot-line cutover from 33 kv. to 60 kv. on Washington Water Power Co. 25-mile line from Chewelah to Colville. It's latest step in company's program to bolster service and at same time to standardize on transmission voltages. Cost with new subs was approximately $100,000



Line breaks, welds and still carries 95,000 kw. Strange case of trouble recently occurred at Northwestern Electric Co.'s West Vancouver switching structure in which: (1) One phase conductor burned off at "A" where jumper from switch connects to line conductor; (2) This permitted line wire to pull out away from structure, causing lower part of spill gap at "B" to pull up on level with top crossarm; (3) Switch jumper "C" fell down on spill gap rod "B" and welded solid without causing a line outage; (4) Line operated in this condition with loads up to 95,000 kw. for an unknown length of time, until discovered by a groundman cutting grass around structure, after which a regular shutdown was made for repairs



Knockdown Steelox field office and warehouse, latest type of portable building to be used by Pacific Gas and Electric Co. As compared with quonset huts and prefabricated wooden buildings used in the past, this steel assembly appeals to construction men. In fact, the same type of flexible steel structure will be used for small substation housing. Accompanying photographs were taken at PG and E's new 220-kv. Moraga substation



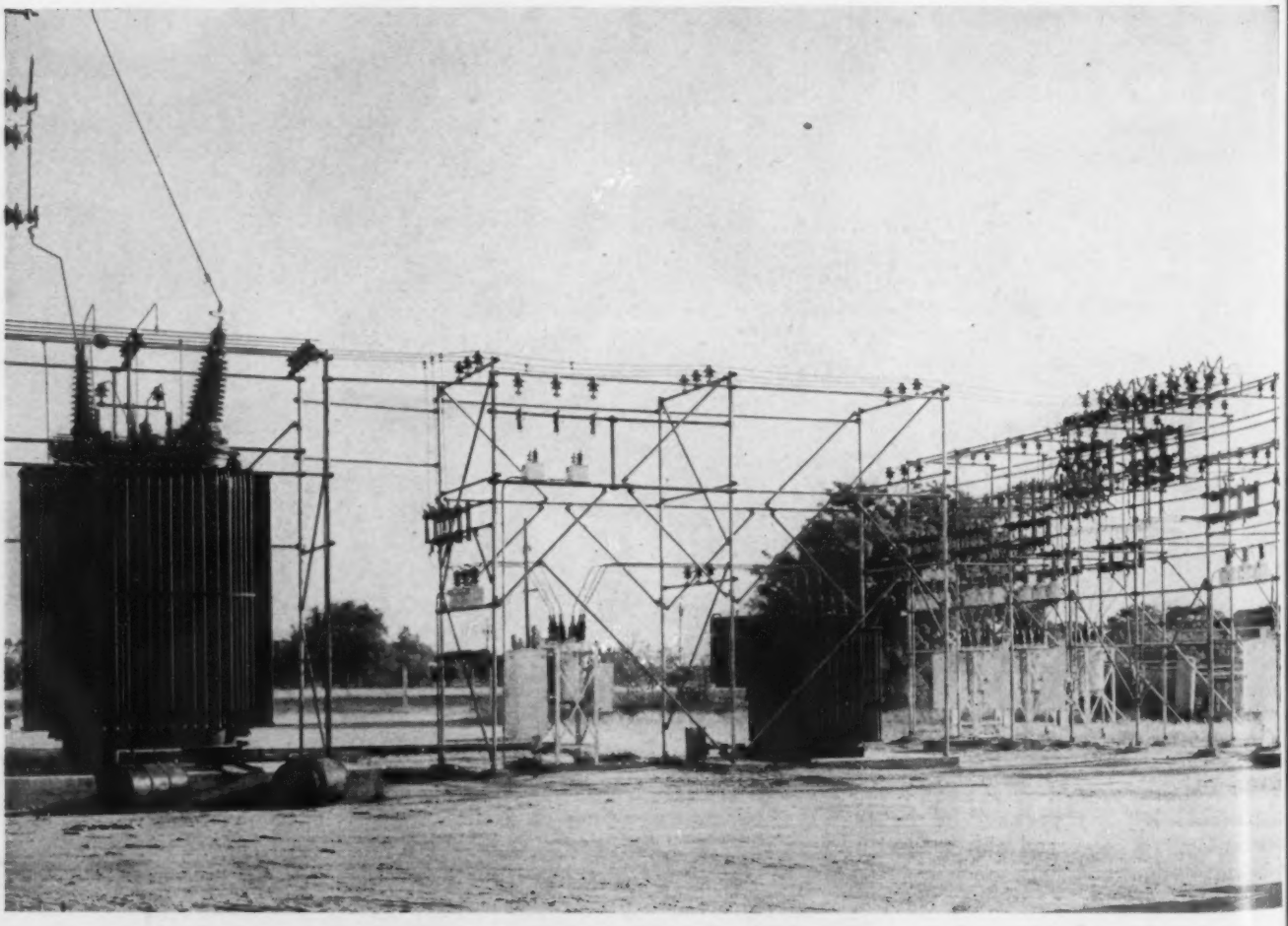
Spare Transformer Switched Hot

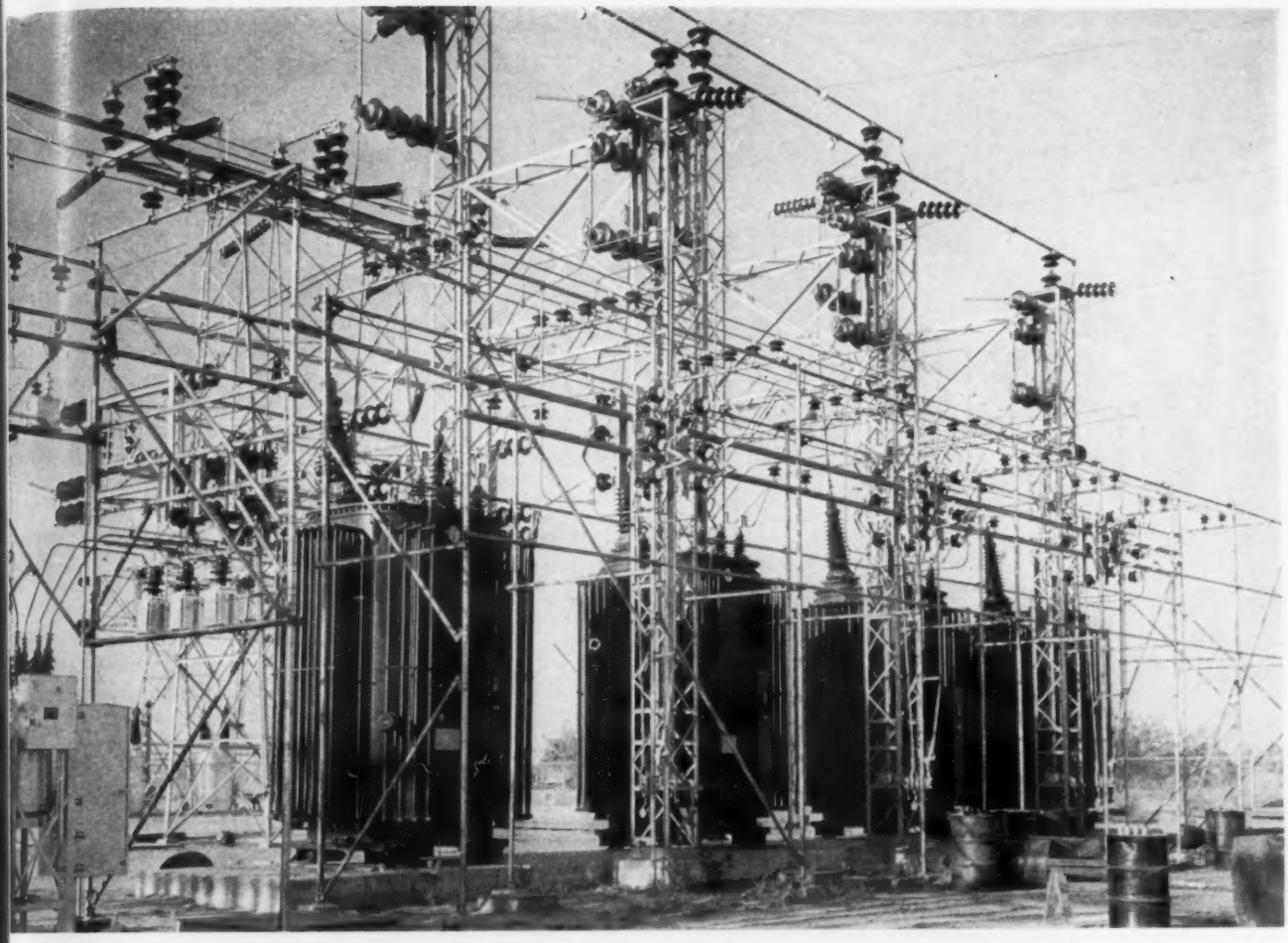
C. E. Plummer
Modesto Irrigation District

To meet the rapidly growing power needs of the Modesto and Turlock Irrigation districts, distributors of electric power in their respective areas, an agreement was entered into with the city and county of San Francisco to obtain power from the Moccasin Creek power plant, a unit of the city's Hetch Hetchy water and power system. To effectuate the contract, the Modesto Irrigation District built a 36,000-kva. substation alongside the city's 115-kv. lines and an interconnection was made with the district's existing 69- and 12-kv. systems. There are several interesting features to this station.

The city's twin-circuit steel tower line extends from the Moccasin plant to Newark substation of Pacific Gas and Electric Co., a distance of 99 miles. The district, which serves an area of approximately 140 sq. mi., is located about mid-point on the line, which also passes through the approximate center of the Modesto District.

To tap off the double-circuit 115-kv. line, each circuit was flattened out on two steel "A" frames by San Francisco. The district strung a cross bus between steel tower "A" frames at 90° to, and 10 ft. below the city's line conductors. Aerial taps were then made between the wires of the line and the bus. This proved a simple and inexpensive means of tapping the transmission line. San Francisco provided 115-





Special bus arrangement for switching spare 10,000-kva. transformer in and out under load is shown above. Paralleling is completed on low side by type of 12-kv. switch, below, which also is opened first in switching to take out transformer. With drawing of the arc in opening the switches the impedance increases rapidly and by the time the arc is broken all load has shifted to the paralleled transformer and switches finally break charging current only

kv. gang-operated air disconnect switches for isolating the line on either side of the station in case of trouble or for repairs. Switches also made possible feeding the line from either Moccasin or Newark, an important feature both to the city and the district.

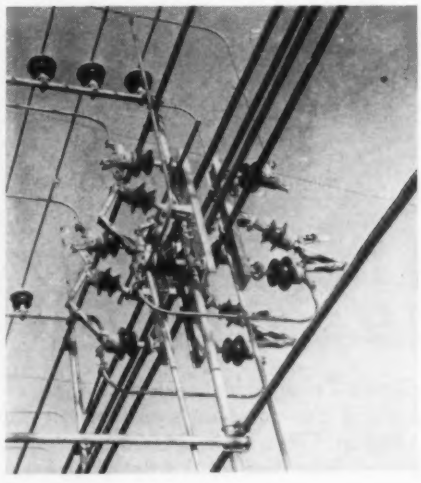
Station transformers consist of a spare and three 115-kv. to 69-kv. to 12-kv. autotransformers. The 69-kv. winding has a bank capacity of 30,000 kva. and the 12-kv. delta winding a bank capacity of 6,000 kva. Transformers are oil insulated self cooled with provisions to add forced draft air cooling as they become loaded. This feature will increase the capacity by a third. The delta windings were built with the added capacity so that 12-kv. distribution could be taken directly out of the station.

This station will at times be carrying the total load of the Modesto District and at other times a major portion of it. There being only one bank of transformers, it was necessary to work out a scheme by which to switch any one of the four transformers in and out of service without de-energizing the bank. This was accomplished by means of air switches as shown in one of the accompanying photographs. The charging current of the transformers is both made and broken by the 12-kv. air switches shown in the photo.

The upper portion of the photograph showing the transformer bank shows both the 115-kv. tie bus and the 69-kv. tie bus to the spare transformer. Another photograph shows the double acting disconnect on the 115-kv. bus. There are interlocks between these switches so that both cannot be opened at the same time. The same is true of the switches on the 69-kv. side, which are of a similar type.

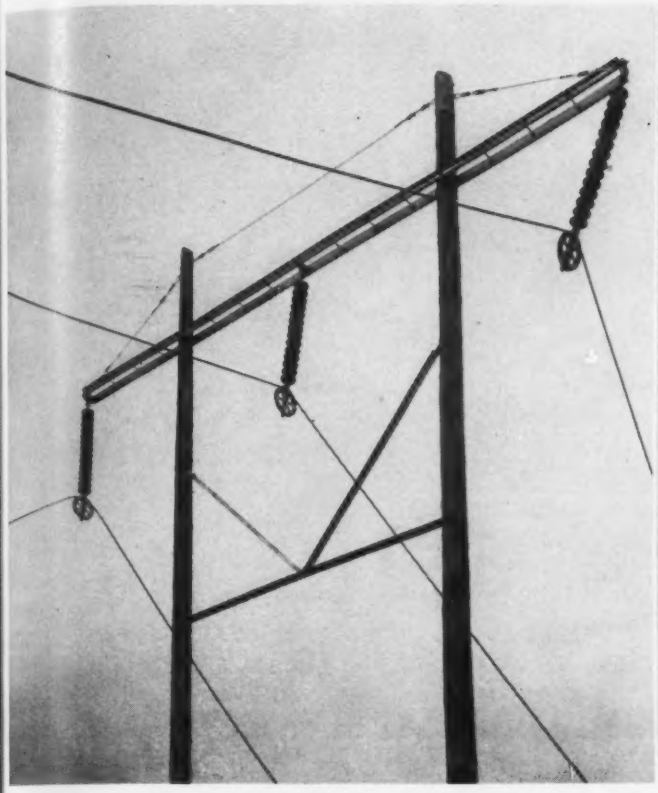
The station being located about midpoint on the transmission line, it is subject to wide voltage variations depending upon the load being delivered to Newark or whether the station is being fed from the Moccasin end of the line or the Newark end. Voltage on the 115-kv. side may vary from 101 kv. to 121 kv., depending upon conditions. It was necessary therefore to provide voltage regulation to meet this problem. The transformers were set on a 110-kv. tap and a step-type regulator was provided to give a 10% buck or boost. One of the photographs shows the regulator and the 12-kv. switching structure.

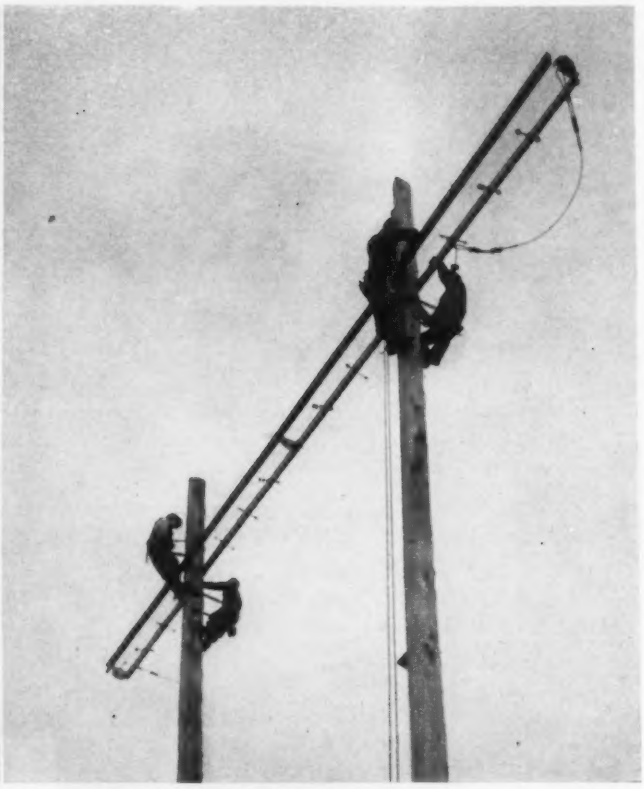
Although the station is now in operation, there are several features still incomplete, including supervisory control, carrier current telemetering and the communication systems.



66-kv. line under construction by Northwestern Electric Co. from Troutdale to Albina substations will provide first permanent direct tie between the private utility and the Bonneville Power Administration. Troutdale substation, under construction by Bonneville, will have 300,000 kva in two transformer banks of 150,000-kva. each, fed by a 230-kv. loop from its Coulee-J. D. Ross substation line on the north bank of the Columbia River. Later, Portland General Electric Co. will receive additional Bonneville power from Troutdale. Northwestern's new 66-kv. line is 16 miles long; of wishbone construction with spacing for 110 kv. Conductor is 795,000 cir. mil ACSR. Dension & Stone, electrical contractors, are building the line from Troutdale to Portland city limits; Northwestern, that part within the city. The first 150,000-kva. bank at Troutdale, the largest transformers ever built, is not scheduled for service until December this year

Crown-Zellerbach's new substation at West Linn, overlooking the company's mill across the Willamette from Oregon City. This 24,000-kva. substation, fed from a 57-kv. loop line of Portland General Electric Co., will step down to 11 kv. to supply additional power for pulp grinding during low-water season on the Willamette. Crown-Zellerbach, with contract for paper for "Life" and "Time" magazines, is installing a new paper machine





Aluminum crossarms for H-frame wood pole 230-kv. construction had to be resorted to by the Bonneville Power Administration for its latest 230-kv. transmission line because of inability to secure suitable Douglas fir timbers. The line, from Arlington to Blaine, Wash., joins at the Canadian Border with a 230-kv. line built by the B. C. Electric Railway Co. Arms are made of two 6-in. or 8-in. aluminum alloy channels placed back to back and stitched together at 2½ ft. intervals by double-arming bolts. To permit use of smaller shapes a ½-in. galvanized steel hanger cable was employed. Because of the metal arms, conductor spacing had to be increased to 18 ft., requiring 40-ft. arms. Channels are so light that a man easily holds the end of an arm in one hand. Comparative estimated costs installed were: $222.13 for aluminum; $108.91 for plank; and $221.65 for spar arms. Costs do not take into consideration far greater life of the aluminum with no deterioration in strength

First floor, 50x60x11 ft., gets 20 f-c in circulation area and vertical surfaces, 40 on counters, 80 in show cases and 100 to 150 on counter feature display under eyeball units; from 40-watt F lamps in cove and behind it, ceiling-recessed Slimline troffers, 200-watt Holophane downlights and 150-watt RSP lamps in eyeball units

Niches in stair wall stand out with 200 f-c from bank of eight 30-watt F lamps in niche ceiling. Position of cove in respect to wall can be seen on the upper floor

One of two show windows, 8 ft. high, 5½ ft. deep, where 150-watt reflector spots are mounted 5½-in. above eggcrate louvers, painted with alumalite, on 12-in. centers. Additional eyeball units with 150 RSP lamps permit high-spot feature lighting. Holophane units are also used to light the outside vestibule area

SPORT SHOP

Roos Bros., San Francisco, asked Architect Albert R. Williams for the ultra in a modern sport shop addition. He called in Sam Hazleton, G-E illuminating engineer, to work with his designer, V. Oglou, to get a "1-3-5-10" ratio sales lighting interior. Victor Lemoge, contractor, had California Electric Supply make Slimline fixtures. Basic idea was a cove, shown above, lamped with 40-watt F lamps, behind which reflectors mount additional 40-watt F lamps directed at the wall. Below: Receiving room in basement with 13.8 f-c

Rewiring on a Limited Budget

Scott Beamer
Clyde Bentley Co., Engineers

Evidence that rewiring can still be accomplished without much of the friction frequently encountered on such jobs these days is offered by the renovation of Veterans' Administration offices at 180 New Montgomery St., San Francisco. Careful advance planning by all who had a hand in the work, coupled with subsequent coordination and readiness to cooperate led to completion on time and general satisfaction with the results.

Branch 12 of the Veterans' Administration in San Francisco already had 1,000 employees at work in the building when the modernization was undertaken. They inherited not only a non-modern building, but considerable hit and miss revamping, undertaken on a temporary basis by various elements of the army, which had occupied the structure previously.

The building consists of seven stories and basement, each approximately 120x150 ft., and the area which was relighted totals about 180,000 sq. ft.

Obstacles to the rewiring included both the 1,000-person staff at work in the building and a limited budget. The first was taken care of by careful determination of the amount of work under way at any one time—making it small enough to avoid confusion, but large enough (12 to 18 men working) to keep it moving.

The second obstacle, limited budget, was met by eliminating nonessentials. For example, wall switches and pull switches were eliminated, convenience outlets were not installed except where the need for one was clear, fuses rather than breakers were installed at lighting load centers. Such measures were so successful in bringing the job within the budget limits that it became possible to recommend and install better wiring and facilities in the medical clinic, photograph and photostat rooms and radio transcription studio.

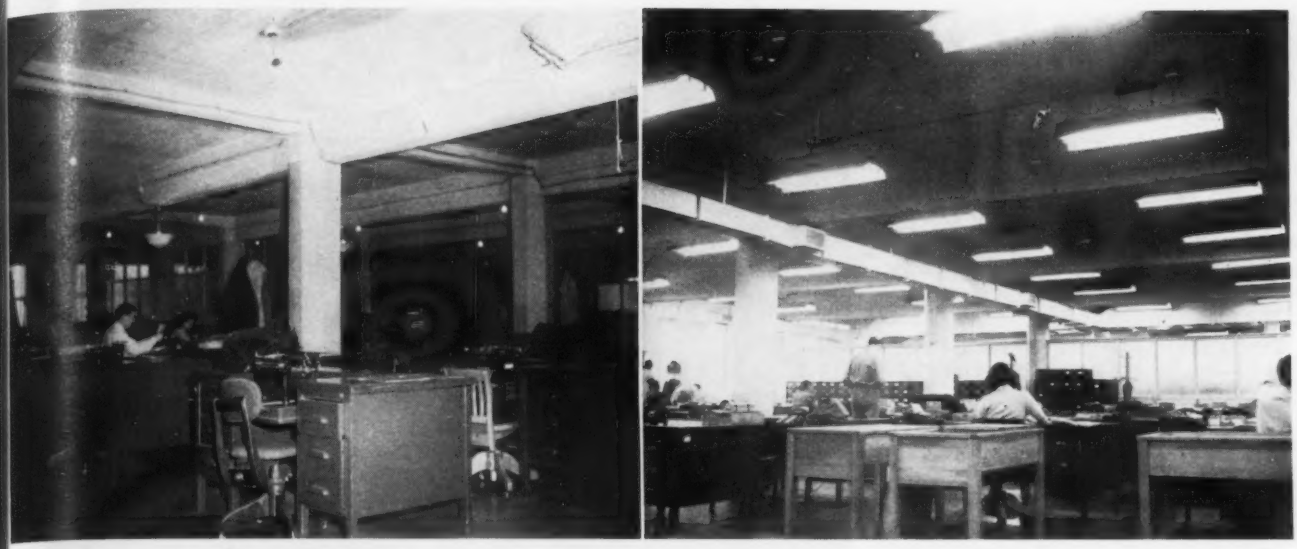
General dimensions of the job can be inferred from the fact that 3,558 outlets were provided, including 2,627 where new fixtures were installed, and 21 branch circuit panels were added and 120,000 ft. of wire pulled in. Of the fixtures, about half were new, and half overhauled.

Some general decisions as to the nature of the job, in addition to those already mentioned, included provision for: installation of two load centers per floor, symmetrically situated about 60 ft. apart; 1,200 watts per lighting branch circuit; six duplex convenience outlets per circuit; lighting fixture spacings not over 1¼ times the mounting height.

Plastic wire and EMT were used on all exposed metal home runs. Plastic wire was also used in cases where it permitted a saving in conduit size.

Among the interesting procedures developed on the job was one for drilling. This was no small item, as some 20,000 holes had to be drilled, many

Fused panels used for economy. Clever drill jacks to bore ceiling slabs used by Al Gillingham and Bill Ruthledge



Previous lighting from bare lamps mostly, whereas after rewiring and relighting F-lamp fixtures gave ample distribution

in concrete. Charles Lilijefelt, foreman on the job, suggested the use of Carboloy tip drills for this purpose. These, together with drill jacks made up as illustrated, considerably expedited drilling and turned a laborious, back straining piece of work into a comparatively simple operation.

Rolling scaffolds for overhead work were introduced by Hal Norse, Clinton Construction Co. superintendent. These were a great improvement in safety, convenience and speed of work and prevented the loss in time that would result from the running up and down and moving ladders. In addition to diminishing the hazard of falls and giving the men greater freedom for work, these accommodated tools and materials for several hours.

The upper right-hand photograph is typical of the results. Previously, lighting had varied from place to place throughout the building. In some cases it was less than 5 ft. candles, and in some cases was provided by single, 300-watt bare lamps.

Those connected with the rewiring included George Hales, representing P.B.A. Clinton Construction Co., the general contractors; George F. Brayer, the electrical contractor, and Clyde E. Bentley, consulting engineer.

● INVITATIONS have been extended to contractors, wholesalers, architects, utility lighting men and consulting engineers to participate in a national contest for planned lighting installations completed in 1946 or 1947, as a feature of the second International Lighting Exposition, to be held at Stevens Hotel, Chicago, Nov. 3-7, 1947, under auspices of the industrial and commercial lighting equipment section of National Electrical Manufacturers Assn. Information about the contest, as well as the exposition and its concurrent lighting forums, has been given wide circulation. Deadline for entries is Aug. 31.

No Examinations

Attempts to amend California law to permit municipalities again to require and conduct examinations for local electrical licenses failed as Assembly Bill 910 was killed in committee. Two other bills, AB 960 and SB 1160 suffered a similar fate as the AGC lobby put pressure to kill these measures. These bills were sponsored by electrical contractors and inspectors association groups because a state supreme court ruling had negated the right of a city (Fresno vs. Howarth) to require passage of an examination before a local license could be granted. The superior court in Fresno had held that all that was necessary was a state contractors license. Thus all local ordinances requiring examination were voided. Meanwhile the California State Contractors License Board has stiffened its technical requirements in the examination it gives applicants for a state license.

● A. B. SMEDLEY, who wrote of the "push-button" wiring system for home installation, now has the system of relays and controls developed into a package. It makes use of a small relay, operated at low voltage from push buttons and bell wiring, which can be installed in an outlet box at the lighting unit. This permits elimination of switch loops of 110-volt wiring and also permits a variety of control setups.

● SAN DIEGO county board of supervisors adopted a county electrical ordinance which became effective July 1. It requires that wiring in the county shall conform to standards set forth in the National Electrical Code. The adequate wiring committee of the Bureau of Radio & Electrical Appliances of San Diego County, of which E. W. Meise is chairman, presented the ordinance to the supervisors for adoption.

● CORDS and cord sets bearing the Underwriters' label may have a new type of plastic label instead of the metal clip formerly used. The new label was developed by J. L. Entwhistle Co. and is applied by a special machine to the cord. It is permanent, will not rust, come off, nor cause runs in stockings.

● FRANK SHORT, former electrical engineer for the California Division of Industrial Safety, who now is consulting engineer representing the oil company and moving picture studios, issues bulletins to his clients giving advice and interpretation of electrical laws or rules affecting them.

● KELOWNA, B.C.'s municipal plant being unable to handle additional load, that city has prohibited the installation of new electric ranges and water heaters by municipal regulation. The city's power supply is being conserved to carry the load through the packing season.

● SLIMLINE lamps can now be operated at as high as 300 ma., according to new information from the lamp companies. At such current density much higher brightnesses are developed.

WARM LIGHT

Warmth is added to the cold cathode white light with which the Seaside Co. plunge at Santa Cruz is illuminated by using two rows of cerise and two of white 25-mm. tubing on each 75-ft. girder. Through switching, several effects can be obtained, according to Ralph N. Gray of Santa Cruz Electrical Co., which designed, manufactured and installed the job.

Because of the humidity around such a large pool of warm water, special attention was given to the type of electrodes and fittings used. Many were tailor-made for the job and special disconnecting means provided at each transformer box to eliminate danger in servicing.

Light output, with white alone, is 11 f-c.; with rose alone, 7 f-c., and together approximately 14 f-c. Total wattage is 12,608 or 12 kw. All tubing was curved to fit the arches. The installation, a relighting job, is said to be one of the largest of its kind in the country, certainly in the West.

UP UNDER

Hardest thing to light successfully is the undercarriage of a truck or automobile during servicing operations, greasing or repairs. The light source has to be low and thus causes glare in the eyes of the worker. But at the huge new truck service station owned and operated by Dick Stricklen and Walter Jayes on Highway 99, two miles south of Bakersfield, Ellis Willitts, electrical engineer of Associated Oil Co., San Francisco, designed lighting that has solved this problem. It is installed in both of two 70-ft. long greasing pits for trucks and trailer combinations.

Inset in the concrete sidewall of both sides of each pit is a continuous channel, covered by rubber gasketed and sealed wire-glass, in which is mounted a continuous row of 96-in. Slimline lamps, operated at 200 ma. Every 16 ft. a handibox is cast in the concrete to hold the ballast and the terminals for the lamps. The illumination reaches every part of the truck bottom and is glareless.

Quick Catch-up

Within the last month or so the various associations in the West did the following things. So much has happened and space is so short that with apologies the accounts must be brief:

Pot & Kettle Clubs

Held annual election at convention, Feather River Inn, electing James Cummings, Schwabacher Hardware Co., Seattle, president, succeeding Charles G. Putnam, San Francisco. Voted to cooperate in federation of housewares clubs. Named Fred C. Wood and Clark Wright delegates to represent them at National Association of Housewares Clubs in the fall. . . Formed a new club at Denver of which Kenneth J. Dahm was named temporary president . . . Elected Arthur J. Hitt as president of the San Francisco club. . . . Started distribution of its 1947 National Housewares Directory, biggest in history, with 434 pages, selling at $5.

IES

Oregon Chapter, Illuminating Engineering Society, heard Fred Waker, Crouse-Hinds engineer, talk on elements of vapor-proof and explosion-proof lighting equipment.

Washington State chapter heard Willard Brown, G-E Lamp, Nela Park, explain the glare rating tables developed by Ward Harrison . . . Held annual ladies night; subject, Home Lighting, by Margaret Hyland and Dorothy Constans . . . Installed Emory Branch, Puget Sound Power & Light Co. as chairman, succeeding B. T. Heinz.

Rocky Mountain Chapter, Denver, met at Stapleton airfield where Thorle Vieau showed the group the new airport lighting equipment.

Northern California Section, San Francisco, heard J. David Gladstone, chief engineer, Tru-Air Division, Mitchell Mfg. Co., discuss applications of germicidal lighting units for protection of persons and of products from air-borne bacteria and molds, yeasts and fungi.

Southern California Section, Los Angeles, had a school lighting symposium when Foster Sampson, consulting engineer, discussed the IES recommended practice standards, and Charles D. Gibson, state department of Education, talked on bi-lateral school lighting. Gibson gave portions of the new Guide for Planning School Plants, dealing with lighting and told of his recent speaking and inspection tour of Michigan. . . . Plans to open the fall season with a smoker and installation of officers, Sept. 5 at Rodger Young Auditorium.

IES national convention or technical conference will be held in New Orleans Sept. 15-19.

NEWA

Pacific Zone, National Electrical Wholesalers Assn., will hold its fall conference at Mission Inn, Riverside, Nov. 13-15, according to R. A. Balzari, managing director.

IAEI

Another Westerner becomes president of the International Association of Electrical Inspectors, as W. R. Volheye, chief electrical inspector, Oregon state, succeeds Ben Hill, retired Oakland electrical superintendent, who was president last year. Arthur Veit, Los Angeles county electrical inspector, was named fourth vice-president.

Some differences of procedure over past annual meetings are to be noted in that of the Sept. 29, 30 and Oct. 1 meeting of the Southwestern Section, IAEI, at Mission Inn, Riverside, over which Larry Trim, Burbank chief inspector, section president will officiate. The first day's program will end at noon after the preliminary business session. Special trips and events for the ladies and men will be held that day. Tuesday will be devoted in full to the code program, with special panels appointed to discuss and answer questions on the various articles. Papers will be presented by H. H. Watson, General Electric Co., Schenectady; L. D. Price, National Electrical Manufacturers Assn., New York, and Harold L. Gerber, electrical engineer, San Francisco. The dinner dance will be held Tuesday evening. Wednesday continues code discussion and finishes the conference with election of officers and business. Wednesday afternoon.

Utah Chapter IAEI made a 200-mile trip to Nephi and back for its last meeting, where Past Chairman Ray Powell was host. J. Hyde Stayner and L. John Christensen were speakers, giving respectively the history of the association and of the electrical industry and the National Electrical Code. Attendance was 66.

Code discussion was led by W. L. Gaffney, Northwestern Section secretary, Tacoma, at the last quarterly meeting of the Puget Sound Chapter, at Everett. Next meeting is scheduled for Sept. 6 at Bellingham.

Small city problems were explained by L. B. Bardarson, Delano inspector, and bungalow wiring by Roy E. Colby, Fresno assistant inspector, at the first meeting of the Central California Chapter held at San Luis Obispo, July 12. L. B. Sterling, chairman, Fresno chief inspector, presiding.

Northern California Chapter has held two outstanding meetings since last reported, one at Santa Cruz, the other at Oakland. Chairman R. B. Maxwell's plan of having members submit questions to a panel of experienced inspectors and limiting discussion to a 15-minute period has proved stimulating and valuable to inspectors and contractors. Actual field problems of interpretation are discussed if no answer is worked out in the meeting, a committee is appointed to give it further study and report at the next meeting. Motor branch circuit protection inconsistencies between the requirements for machine tools and for similar groupings of motors in other manufacturing processes were aired at Oakland. Speaker on the afternoon session was N. S. Bever, Bussmann Mfg. Co., who told and demonstrated how Fusetrons protect motor and lighting circuits without overfusing for surges or motor starting. At the previous meeting Leonard Hobbs, Smoot Holman Co., told of problems relating to manufacture of fluorescent lighting equipment. (Excerpts may later be published in ELECTRICAL WEST.) Next meeting will be in San Rafael, Sept. 13.

Southern California Chapter likewise held two meetings, one at Long Beach in May and one in Los Angeles in July, chairmanned by Ken Howard, South Gate inspector. The chapter's model ordinance draft, printed and distributed is to receive further consideration before final printing. J. A. Derque, Bussmann Mfg. Co., talked of improved circuit protection with Fusetrons which permit fuses and switches of smaller ratings because of the time lag feature. A. B. Smedley explained the operation of cold-cathode lighting and the new terminals to open the primary circuit when a lamp is removed. The July meeting combined a visit to the new Square D Co. plant.

EMEA

A night double-header pulled a big crowd of Northern California Electrical Maintenance Engineers in San Francisco when Frederick C. Guthrie, Electrical Machinery Mfg. Co., taught the ABC's of synchronous motors, explaining their theory, construction and advantages in specific applications. Leon Le Mateyer, wartime maintenance engineer and instructor for Permanente Metals Corp. and winner of three awards from the WPB for maintenance ideas, spoke of the fundamentals of good maintenance work—"if a job is bright, tight and right," he pointed out, a lot of maintenance troubles are avoided.

Roy Bryant, electrical engineer, General Petroleum Corp., gave such a practical talk on electrical equipment in the petroleum industry, particularly in refineries, that space for more of his observations will be sought in a later issue. He addressed the June EMEA of Southern California meeting, over which E. S. Reichard presided. The July meeting heard Don Karlskind, U. S. Rubber Co., wire and cable division, speak on aluminum wire. Television station trips to Mt. Wilson were arranged by Program Chairman Henry Ledeboer, in groups of 50 on Sundays.

NECA

With the annual convention of National Electrical Contractors Assn. due to be held in San Francisco, Sept. 9-10, things were not at all peaceful in the area at time of going to press. Indeed there was more than a possibility that if NECA headquarters could not get IBEW headquarters in Washington to ease an untenable situation in the Oakland and Contra Costa County area, all the chapters of NECA in California might withdraw to form a California association instead. The reason was a strike or walkout called by IBEW locals 595 and 302 over demands in a new contract and refusal to consider counter proposals in a contract offered by the electrical contractors' association. The latter had agreed to a new wage increase of 25 cents an hour for each classification, but would not accept the vacation with pay proposal and asked for wage cost protection on work already bid at the old rate. Two other issues emerged when the locals refused to recognize the NECA chapters and branches as bargaining agencies and sought to sign up individual shops to its contract. They were recognition of the chapter as bargaining agent and inclusion of a provision for final appeal to the Electrical Industry Council of Industrial Relations. Another issue of long standing was the handling of clearance of wiremen recruited by contractors when the local could not furnish enough men and the domination of apprenticeship applications in defiance of the former contract by the leadership of the union. A delegation of representatives from the chapters around the Bay area flew to Washington to meet with IBEW and NECA top men to seek to reach some amicable settlement of the two-week-old walkout and impasse. The Conference of California Chapters in its meeting in Oakland July 19 backed up the Northern California Chapter.

Productivity of electrical workers in view of high wage costs will come in for an airing at the NECA convention. A forum type of meeting will be held on one day of the convention to bring out what ideas there are to cope with this situation. It requires joint responsibility by both management and labor, Robert McChesney, president of NECA, says, to increase productivity.

In theory NECA is closer to labor than it has ever been. Wages paid are high. To justify them with the public will call for high output per man-hour. Local convention arrangements have been placed in charge of W. J. Varley, manager of the San Francisco Chapter, who has established headquarters at suite 2058-60 at the Palace Hotel. Edward Conroy, vice-president of the San Francisco association is chairman of the convention arrangements committee and has appointed Noble Wright, W. B. Baker, Ed Dowd and C. C. Severin on his committee. Clyde Chamblin has been named chairman of the reception committee, George Abbett of the transportation committee, Lou Stolowitz the entertainment, Mrs. Thomas Harris, the ladies committee and W. A. Cyr, publicity. Entertainment of delegates will include trips around the bay region, luncheons at Fishermen's Wharf, golf at Crystal Springs, and a banquet at the Palace Hotel. Reservations at the Palace are filled and the St. Francis and Sir Francis Drake are also designated as convention hotels.

BULLETIN—The strike of IBEW locals 595 and 302 against Alameda County (Oakland) and Contra Costa County branches of the Northern California Chapter, NECA, was settled by conference of representatives of all parties in Washington, D. C., with Dan Tracy, IBEW president, and Paul Geary, NECA executive vice-president. The pay scale was raised 12½% to $18 a day, the same as the San Francisco scale. Vacation was to be developed by a joint committee of local and chapter, failing which by November, it was to be submitted to IBEW and NECA headquarters. No protection was given except on one hardship case. The chapter is recognized as bargaining agency and its request for clearance of new men was granted. Nonmembers will get the same terms.

Area covered by the Los Angeles Chapter, NECA has been enlarged and it may soon be known as the Southern California Chapter, as Santa Barbara, San Bernardino, Riverside, Orange and Ventura counties are added to Los Angeles County. Las Vegas, Nevada, may also be in the chapter territory. Divisions or branches will be established in other cities or centers, the first of which is the newly organized Orange County division, Cal Gilbert of Santa Ana is chairman, Harold Grimes, vice-chairman and Harold Nelson Stafford is secretary.

San Diego Chapter of NECA has a new manager, Harry Lemon. He succeeds C. W. Mowry who resigned to take up farming.

Rocky Mountain Chapter, NECA, will elect new officers at its Aug. 4 meeting. Nominated for office were Bert Stiles, Electric Motor & Wiring Service, for president; Paul Jussel, vice-president; Karl Krummel, treasurer; Dale Strohminger, Gene Snowden and Ralph Johnson, retiring president, as members of the board. Joe Simpson of Cheyenne and James Flavin, Casper, are Wyoming members.

Leagues

Annual conference of the International Association of Electrical Leagues will be held in St. Louis, Mo., Oct. 8-11. J. Clark Chamberlain, manager, Bureau of Radio & Electrical Appliances, San Diego, is the Western advisor on the program committee.

RMEL

Plans are shaping up for the annual convention of the Rocky Mountain Electrical League at Casper, Wyo., Sept. 3-5. Convention chairman is W. D. Johnson, manager, Mountain States Power Co. at Casper. . . . The joint industry-wide picnic was held at Elitch Gardens, Denver, July 18, with just about everyone in the electrical business attending.

IEA

Grand opening of the Utah Centennial Home in Salt Lake City, jointly sponsored by the Intermountain Electrical League, was held July 24. It has complete adequate wiring, planned lighting design and an all-electric kitchen. . . . The annual outing of the electrical industry is scheduled to be held at Lagoon, Aug. 20. Henry Falkner, Westinghouse, is chairman. . . . Laurence Wray, managing editor, *Electrical Merchandising*, New York, addressed the Salt Lake retail chapter last month as he ended his tour of the West in company with Howard Emerson, Pacific States associate editor. . . . Cache Valley Chapter was organized at a recent meeting in Logan. Lynn Thompson was named president, O. R. Baur first vice-president, W. E. Dunbar, secretary. John Longden, IEA president and J. F. McAllister, secretary, assisted manager Art Reynolds at the formation of the chapter. . . . Delta, Utah, is considering formation of a chapter. Mayor Black of that town is leading the organization. . . . C. W. Flood, Jr., Westinghouse sterilamp division, Bloom

eld, addressed the IEA electric club, alt Lake City last month on *Synonmous—Health Ray and Death Ray.*

SCR & EAA

Having had 20 of its members as xhibitors in the big Home Show and aving had a booth there itself, the outhern California Radio & Electrical ppliance Assn. settled down to its egular program with the initiation of new series of meetings for dealers on he problems of a merchant. Such subects as the fair trade laws, anti-trust aws, co-ops, ethical advertising, etc., re to be handled by qualified speakrs. First was a meeting, July 9, at he Matchless Electric Home, addressed by J. Wesley Cupp, attorney, n *The Present Status of California's air Trade Act.* A forum discussion ollows each speaker to answer dealrs' questions. . . . The association's ponsored radio program, *The Magic f Electricity,* over station KMPC, unday evenings at 8:30, is continung to boom the benefits of electrical ving.

EEDA

Chapter meetings were held in the ewiston, Grangeville, Orofino, and pokane chapters of the Inland Emire Electrical Dealers Assn. in July, nd in Wilber and Colfax the month reviously. Laurence Wray, *Electrial Merchandising* managing editor, old the Spokane group of *Your Comng Competition,* Robert Wilkinson, xecutive secretary, reported on the ssociation activities and Frank Tool, hapter secretary, on organizational rogress. At Wilber, Ray Souther, hapter vice-president, spoke on merhandising, Richard Nelson of Spotane on *The Value of Unity.* At Colax, Homer Bender, Washington ater Power Co., spoke on the adeuate wiring program.

NCEB

Recently elected as officers of the orthern California Electrical Bureau ere the following: W. E. Lange, ohrmann Commercial Co., San Franisco, president; A. H. Meyer, Leo J. eyberg Co., vice-president; O. R. oerr, Pacific Gas and Electric Co., ecretary; Frank K. Runyan, Western erchandise Mart, treasurer; John . C. Ross, PG and E, chairman of the xecutive committee consisting of Fred enz, chairman wiring section; Walter hompson, Westinghouse Lamp Divi-on, chairman lighting section; A. H. eyer, chairman radio section; B. W. eynolds, General Electric Supply orp., chairman appliance section; eorge C. Tenney, ELECTRICAL WEST, hairman education section; R. E. obertson, Frigidaire Sales Corp., red S. Fenton, Easy Washer Co., and T. L. Rosenberg, electrical contractor, Oakland, vice-president of NECA.

Three pioneer lighting engineers happened to meet at a recent meeting of the Nothern California Section, Illuminating Engineering Society, when Preston Millar (right), of Electric Testing Laboratories, Romaine Myers, Oakland consulting engineer and first IES member in the West (left) and James R. Cravath, retired, member emeritus, renewed old times together in lighting history

San Francisco Unit of NCEB reported that 179 homes were wired for electric ranges for the first six months of 1947 under the bureau's three flat-price wiring job classifications, according to Cass G. Running, president of the unit. Everett W. Carlson, Central Electric Co., is chairman of the wiring committee and two firms, Arc Electric Co. and Century Electric Construction Co., are the two firms specializing in range installation through which all dealers are being urged to channel jobs in order to get volume and reduce costs.

Meetings of several units of NCEB were held during the tour of Laurence Wray, managing editor of *Electrical Merchandising,* to the area. Meetings were held at Fresno, San Jose, Oakland and Eureka. At the East Bay Unit meeting in Oakland, Chairman Harry S. Lacey launched a radio promotion campaign of which Homer Smith, of Jacksons, is chairman. It consisted of a radio week during which all dealers advertised and displayed radio, under the slogan, "A radio for every room—and a portable too."

Canada

G. Langtry Bell was re-elected chairman of the British Columbia branch of the Canadian Association of Radio & Appliance Dealers. Bell is manager of Clarkson's Ltd.; John H. Taylor, head of consumer service division, B. C. Electric Co., was named vice-chairman.

Hawaii

So successful was L. W. Clifford of Hawaiian Electric Co. as director of dealer development advisory service that he has recently been promoted to a new job, appliance sales supervisor for the wholesale department of the company, which also is a distributor for Hotpoint and Westinghouse in the Islands. William E. Garrison, for the past year or so Hotpoint regional product specialist on the Pacific Coast and before that for 15 years with the Burroughs Adding Machine Co., has been appointed to Clifford's place as director of dealer development, and begins about mid-August.

Within the past two months, in addition to the Electrical Appliance Distributors of Hawaii, there have been formed both a dealer organization and one of contractors. The Hawaiian Electrical Contractors Assn. was formed first and elected Joseph Aruda, president; Sid Nicholson, vice-president; M. McClaire, secretary; George Moishige, treasurer, and Kenneth Wong, auditor. By-laws and constitution were adopted and six committees were appointed. The dealer group, organized a little later, calls itself the Appliance and Radio Dealers Association of Oahu. (The distinction is that "Hawaii" included members on other islands, whereas "Oahu" indicates the scope of the association is on that island alone, around Honolulu.) Officers elected were: Ralph Miyazono, president; Wm. Nugent, vice-president; L. W. Clifford, secretary; Richard Yamaoka, treasurer. Purpose of the organi-

zation as stated in the constitution is "to coordinate the activities of appliance dealers on Oahu in the interest of (a) the respective dealers as individuals, (b) the several branches of the appliance industry and (c) the public.

NERA

Herb Names of Denver has just been elected president of the National Electrical Retailers Assn. at the July 12 meeting of the executive committee, held in Chicago. Names is a past-president of Rocky Mountain Electrical League and still active in its dealer branch. (See ELECTRICAL WEST, June 1947, p. 101.)

Newest of the associations in the industry, NERA is making rapid progress in its organization in the West. Elmer J. Weinheimer, regional director, reports the formation of new local chapters in Phoenix, Prescott, Tucson and the Globe-Miami-Superior market areas of Arizona and further chapters are in process of formation. Local chairmen of the chapters are: Phoenix, Pat O'Hara, Ace, Lance & O'Mara Refrigeration Co.; Prescott, A. D. Fee, Prescott Appliance Co.; Tucson, Cecil E. Gaver, Electric Service Co.; Globe-Miami-Superior, James R. Eager, Globe Radio & Appliance Co.

Electric Clubs

Los Angeles Electric Club wound up its fiscal year with the customary stag party after electing a new slate of officers. Sam W. Scott, Graybar Electric Co., succeeded Walter Stickel, L. J. Meyberg Co., as president; Randolph Karr, Pacific Electric Railway, is first vice-president; Howard L. Stolper, Burbank contractor-dealer is second vice-president; J. A. Long, Southern California Edison Co., is third vice-president; Ralph T. Adamson, Westinghouse, secretary-treasurer; Paul L. Mullenbach, Mullenbach Electric Co., is sergeant at arms, and the executive committee has on it I. L. Bateman, Fred Garrison, W. D. Howze, E. E. Karsten, and Past President Stickel.

Sacramento Electric Club has been reactivated again, under the leadership of Clark Baker Jr., Westinghouse Electric Supply Co., of that city. Meetings are held once a month, about the third Wednesday of the month, in the evening.

Others

Walter Sturrock, illuminating engineer, General Electric Co., Nela Park, Cleveland, will be the one speaker on lighting at the American Society of Mechanical Engineers fall meeting which will be held at Salt Lake City, Sept. 1-4. He will discuss industrial lighting applications.

President Warren W. Farr of Cleveland toured the West and met with associations in Los Angeles, San Diego, Portland, Seattle, San Francisco and Salt Lake City affiliated with the National Association of Refrigeration Contractors, last month. Annual meeting of the national association will be postponed until the week of Jan. 27, 1948, to tie in with the all-industry refrigeration and air conditioning exposition in Cleveland.

RMEL Active

The Rocky Mountain Electrical League is active on various fronts, principal among which is polling power companies and the petroleum industry to determine what firms desire which of the 31 frequencies allocated to such purpose by the Federal Communications Commission.

RMEL accepted sponsorship of the project for Colorado, Wyoming, New Mexico and part of South Dakota; and Ralph B. Hubbard, manager, reports that numerous concerns whose efficiency depends on quick communication on extensive and isolated power lines or pipe lines have manifested great interest. Prospects are that fixed transmitting and receiving bases, with mobile units in the field, will soon be the rule, rather than an exception. At present, only the city of Lamar, Colo., operating its municipally owned electric system, is equipped with mobile two-way radio communication.

FCC regulations designate frequencies in the 75-, 153- or 158-megacycle wave bands for stations covering areas of less than 20 miles; those over 20 miles are entitled to the 30-40 mc range.

J. M. Wissenbach, Public Service Co. of Colorado, is acting chairman of RMEL's Mobile Communications System interim committee, assisted by representatives from the Lamar Light and Power, Western Colorado Power, Black Hills Light and Power, Southern Colorado Power and Home Gas and Electric companies. W. E. Clyne, district federal radio inspector, is cooperating in a technical advisory capacity.

The Lighting School sponsored by RMEL for Public Service Company of Colorado employees and sub-executives has drawn to a close after more than two months' operation, with fourteen "upper classmen" apparently headed for "summa cum laude" degrees this summer . . . The course, which follows the Westinghouse instruction pattern with sound records and movies, started with an enrollment of 55, with salesmen from the Lamp Division participating. As studies entered higher technical brackets, the merchandisers, equipped with all the information required for sales purposes, retired to their customary sphere, leaving lighting division engineers to carry on. The Westinghouse course, for most of the current class, is in the nature of a "refresher," bringing veteran engineers up-to-date on new developments; to half a dozen recruits, the entire curriculum is unexplored territory.

Another enterprise on which RMEL has embarked is one seeking bedlamps for patients in the Veterans Administration hospital at Fort Logan, near Denver. Lighting facilities at the VA unit are such as to discourage reading or study after sundown for the bed-fast vets . . . Response from dealers has been gratifying. While many of the contributions were from slow-moving stocks (good as any for the intended purpose), others are highly advanced fluorescent types — a possible hint to the management that such equipment might well become standard and permanently installed . . . One hundred lamps is the goal. At latest tabulation, forty were on the line.

Western Chairmen

To stimulate interest and attendance and to publicize the contest awards connected with it, Western chairmen have been named by the commercial and industrial lighting section of National Electrical Manufacturers Assn., on behalf of the second international lighting exposition and conference to be held at Hotel Stevens, Chicago, Nov. 3-7. Carl O. Martin, Benjamin Electric Mfg. Co., is chairman and J. P. Wade, The Miller Co., vice-chairman of the committee in northern California. M. J. Rudman, The Miller Co., is chairman and Harold Pomeroy, Wheeler Reflector Co., vice-chairman for southern California; W. E. Gnadt, Mitchell Mfg. Co., and J. R. Christensen, of the same company, vice-chairman, for the Salt Lake City area.

● INSTITUTE OF RADIO ENGINEERS will hold its 1947 convention in San Francisco, Sept. 24-26, in conjunction with the convention and exhibition of the West Coast Electronic Manufacturers Assn., Sept. 26-28. General convention chairman is Karl Spangenberg, professor of electrical engineering at Stanford University.

● SAN DIEGO will be host to AIEE members on the Pacific Coast, Aug. 26-29. The meeting will be in Hotel San Diego. Joseph F. Sinnott, San Diego G&E Co., is general chairman.

Roach Named NWEL & PA Head

Thomas E. Roach, executive vice-president and general manager, Idaho Power Co., Boise, was elected president of the Northwest Electric Light & Power Assn. at the annual meeting at Vancouver, B. C., June 27. W. L. Thrailkill, the Washington Water Power Co., Spokane, was re-elected vice-president of the association.

Roach, who left Northwestern Electric Co. on July 1 to take his new position with Idaho Power, succeeds as president of the association James H. Polhemus, Portland General Electric Co., who held the office during the past year. Reports of officers and section chairmen at Vancouver indicated the association had an active and successful year, and was looking forward to additional activity in 1947-48. The association will again feature its intra-industry forum for manufacturers, wholesalers, dealers, contractors and utility people at its annual Business Development Section meeting.

State vice-presidents elected at the meeting were: Idaho, C. J. Strike, Idaho Power Co.; Montana, J. E. Corette Jr., Montana Power Co.; Oregon, E. F. Pearson, Pacific Power & Light Co.; Utah, R. H. Ashworth, Utah Power & Light Co.; Washington, H. C. Webb, Puget Sound Power & Light Co.; and British Columbia, T. M. Moran, B. C. Electric Railway Co.

Members-at-large of the Executive Committee to represent the utilities are: J. A. Hale, Utah Power & Light Co.; Z. E. Merrill, Mountain States Power Co., and James H. Polhemus, retiring president.

Both members and alternates on the executive committee to represent manufacturers, wholesalers, contractors and dealers were elected as follows: members, John F. McDaniel, Hotpoint Inc., Seattle; Dean Pulsifer, Westinghouse Electric Supply Co., Seattle; R. B. Lane, Industrial Electric Co., Seattle; Joseph T. Krivanek, Krivanek Electric Co., Longview, Wash.; alternates, W. D. Robertson, Canadian General Electric Co., Vancouver, B. C.; A. L. Shellworth, Sunset Electric Co., Portland; Grover C. Burke, City Electric & Fixture Co., Seattle, and Arnold Kuhnhausen, Kuhnhausen Electric Appliance Co., Portland.

President-elect Roach has appointed the following section chairmen: accounting, J. E. Winton, Washington Water Power Co.; engineering, L. R. Gamble, Washington Water Power Co.; business development, Howard Walters, B. C. Electric Railway Co., and personnel, O. A. Petersen, B. C. Electric Railway Co.

J. H. Rogers, Idaho Power Co., has been appointed treasurer, and Berkeley Snow, Portland, executive secretary.

Thirteen pioneers in several fields of endeavor in the electrical industry in the Pacific Northwest were honored at the Northwest meeting, by election to honorary life membership in the association. Most of the recipients, who were formerly active in engineering, sales, finance and public relations, had retired recently from active work with their companies.

Heading the list in point of age and early service with the industry was Dr. Edward C. Kilbourne of Seattle, who was among the first organizers and operators of electric utilities in that city in the 1880s and '90s. He was present at the turning on of the first electric lights in Seattle in 1888, and in the same year organized the first electric railway system. Later he organized the Home Electric Co., then the Union Electric Co., through which he operated a light and power service until 1900 when he sold out to Stone and Webster.

Among the engineers and operating men honored were R. R. Robley and Charles P. Osborne, Portland General Electric Co., and George E. Quinan, Puget Sound Power & Light Co., who contributed much to the technical development of the industry in the Northwest, beginning in the 1900s.

William G. Murrin, former president of B. C. Electric Railway Co., represented the top executive element of the industry. In the next executive level was A. M. Chitty, in the industry for 56 years, most of them spent as division manager for Puget Sound Power & Light Co., and Lewis A. Lewis, assistant general manager of the Washington Water Power Co.

Lewis' work as sales manager for the company and his electric range survey of the 1920s was recalled in his citation. Francis H. Murphy, for many years illuminating engineer and consulting engineer for Portland General Electric Co., also represented the sales group, while William H. Ude, Washington Water Power Co., was known chiefly for his work in employee and public relations.

Four pioneers of the wholesaling and jobbing fraternity during the past 40 years or so were: J. Irving Colwell, northwest district manager, and James H. Kelly, sales manager of Graybar Electric Co., Seattle, Harry B. Rogers, manager of the Spokane branch G-E. Supply Corp., and J. A. Kahn, manager of the Rocky Mountain division of G-E Supply Corp., Salt Lake City, all now retired.

The resolution by which these men were elected called attention to "the qualities of leadership, of technical and professional abilities, of broad vision in bringing together all phases in the industry into cooperative effort, of participation in civic affairs and community growth, and of initiative and courage in taking the risks of pioneering a major enterprise of this region."

Line Constructors

With a membership of 30 electrical contracting firms in the states of Washington, Oregon and Idaho, the Line Constructor's Assn. has been formed with head offices in Seattle. R. D. "Russ" Horning, executive-secretary-manager of the Seattle Electrical Contractors' Assn., will serve as manager of the new group. The association has been under formation for the past year and has been granted a charter by the National Electrical Assn., the first granted in the United States.

Branch offices will be maintained in Portland and Spokane with I. W. Rodgers, manager of the Portland Electrical Contractors Assn., in Portland; Paul Heydon, manager of the Spokane Electrical Contractors, in the Spokane branch. Both branch managers will work under Horning from the Seattle office in the Arctic Bldg.

Seattle members of the Line Construction Assn. include: Agutter Electric Co., Puget Sound Electric Co., Industrial Electric Co. and the Montgomery Electric Co.

● REFRIGERATION CONTRACTORS association of Seattle, Wash., and the Inland Empire Association of Spokane, Wash., have joined forces to form the Refrigeration Contractors Association of the State of Washington. Headquarters are in Seattle, in charge of Executive-Secretary Arthur M. Carney. There are forty members. James Lessard, Seattle, is president; S. F. Thomas, Seattle, secretary-treasurer. Five regions have been set up in the state, with a regular monthly meeting scheduled for each. Regional directors are C. L. Guinn, Seattle; F. L. Van Winkle, Tacoma; Fred Cheatham, Olympia; William Vogel, Chehalis; John Lavender, Wenatchee; Clifford Ruxton, Yakima; K. G. Bentley, Walla Walla; Tom Morrision, Pasco, and Ed Matthews, Spokane.

● NEW OFFICERS of the Commercial Refrigeration Association of San Diego, Calif., are Robert Parker, presidentdent; Thomas Swift, Sr., vice-president; George Hunter, secretary; William Fickler, treasurer.

ELECTRICAL WEST
SPOKESMAN FOR THE MOST HIGHLY ELECTRIFIED SECTION OF THE U. S.

More Rubber Yardsticks

FREQUENT mention has been made in these columns over the years of the utter fallaciousness of the "yardstick" theory of comparing electric rates of business-managed and government-owned and operated utility systems. Tax differences, money costs, accounting practices, hidden credits and services—all tend to make such comparisons meaningless. A glaring example of how this works was just recently brought to light in a simple sentence in a report on a meeting of the city council of Canby, Ore., one of the Bonneville Power Administration's touted "low-rate" communities. The council, it seemed, was forced to hire an experienced bookkeeper and accountant. Such an individual was necessary to handle the books and accounts of the city-operated power department. This had been caused by the announcement by BPA that it no longer could keep the books for the city—Congress had cut its appropriations. In the light of this revelation, one wonders how much rubber of this kind there might be in the electric rate yardsticks of other BPA satellites.

Professional Independence

ONE thing the Taft-Hartley Bill does is to clarify the position of the professional engineering employee. Gone are the ambiguity, indefiniteness and uncertainty of the Wagner Act. In their place is a satisfying degree of independence for the professional employee. Instead of being compelled to accept representation by a union in which they have little interest and no voice, they may now choose any one of several courses. If they so elect, they may designate an existing union as their collective-bargaining agency. Or they can name an organization of their own choosing, or set up a new agency of their own. Finally they can waive the right to any collective action if they are so disposed.

How much better this than the provision of the Wagner Act, which gave no recognition to professional employees! The Taft-Hartley Bill not only defines a professional employee, but it permits such employees to withdraw from existing relationships under which they might have been blanketed by the National Labor Relations Board. This new legislation gives employed engineers a real basis for independence and at the same time assures them of the right to collective action—when needed—in their dealings with their employers. Engineers can be thankful that Congress enacted the new law.

Bright Outlook

WHILE the economists and psychologists argue as to whether business will talk itself or work itself into a year-end recession, the electrical industry goes merrily on its way toward higher and higher levels of activity. The power companies are much more concerned about meeting next winter's peak demands than they are about even the remotest possibility of a load decline. In fact it would appear that whatever might happen to the rest of industry, the utilities face the severest test yet of their capacity to serve. Electrical manufacturers' backlogs continue to pile up as orders in most lines exceed shipments. In the appliance field dealers and distributors cannot begin to meet the public's requirements for new appliances, despite the fact that factory production is 50% greater than prewar. Only in the construction field is there any slackening and this is due to public refusal to pay the high prices that stem from high wages and top material costs. All in all the outlook for the electrical industry for the balance of 1947 is exceedingly bright whatever the economic readjustments may be in other lines.

Damaged Goods

OF all of the travail and worry that has plagued the appliance dealer in his postwar business difficulties, nothing has been more discouraging than the damaged merchandise problem. Appliance shortages he could understand, dearth of materials might be explained, but to receive shipments in which one-third or one-half of the appliances are damaged is a major tragedy, particularly since the dealer is likely to have customers waiting for equipment.

In-transit damage is reported almost universally throughout the whole channel of appliance distribution. Wholesalers and distribu-

EDITORIAL VIEWS

tors say that frequently a third or more of a car of washers, refrigerators or ranges will be damaged, either in shipment or in unloading. The claims on shippers are mounting and instead of resultant decrease in damage due to more strict supervision, more and more shipments are smashed, banged, humped or otherwise made unsalable. Ultimately the cost for this wasteful practice will have to be loaded on the customer.

Shippers blame manufacturers for faulty packing and loading. Or they insist that the damage was done in unloading. Manufacturers say that they crate and pack the appliances in accordance with the best modern practice and point out that no crating will protect when a washer is dropped from the top of a two-high tier onto the floor of a freight car.

Without attempting to fix the blame we are prompted to say that here is an opportunity for manufacturers and shippers to correct a distressing situation. The dealer and the customer can't be expected to submit forever to delays stemming from such carelessness.

Snarl Talk

TO read the outpourings of the utility workers' unions in their official papers and magazines is to take a strong dose of snarling and name calling and nothing constructive or genuinely progressive, even if the word "progressive" is used loosely. The copy is full of "struggle," "fight," "busting," and "bitter" talk. Any opposition to the "militant" union is called "stooge," "fink," "stool pigeon," "labor spy," or worse. Especially is this true in the angry outcries against the Taft-Hartley Act.

Now it has been true since the beginning of time that any enterprise exists only to render some service to the public. When it ceases to do that the public obliterates it. And if those who work in an enterprise are not partners with the management or leadership of the business to produce more goods or services for the public, then the enterprise will fail. Snarling, unhappy, paranoidal employees who are working against their will and resenting it, who nurse a persecution complex and feel as abused as these union leadership expressions indicate and foster, certainly shouldn't be working at all. They should be in a mental clinic or asylum trying to find out what makes them so unhappy and anti-social.

Unions have been asking for years for the right to do the bargaining for employees in their relationship with management or employer. They have that right, but with the right there is an obligation too. It is to do the bargaining in a spirit of helpfulness to the joint enterprise. If they assume the obligation as well as the right they will earn employer cooperation and respect. But if they use that bargaining position to poison the enterprise by making the people engaged in it miserable, unhappy, full of self pity and suspicion, they are destroying the very thing that gives them both a livelihood and a place of self respect in serving the community. They invite opposition. Why is this so hard to learn?

WHAT are the salient lessons in the British nationalization system for electricity companies in America? First and foremost, I would say beware of politics, beware of public ignorance of the industry, beware of timorous friends. Human nature is pretty much the same the world over; it is subject to the influences of environment. Don't copy Britain and discount political cranks because they seem to be few and seemingly inconsequential. They used to be few and inconsequential in Britain. Don't take it for granted that what has happened in England could not possibly happen in America. What has happened in England can happen in America if politicians infected with the Socialist or crypto-Communist virus are not challenged at every step. Watch events in England closely. Use every opportunity of driving home to the American public the faults, failures and damaging effects of nationalization. Make it an important part of your educational campaign. Extend that education to England. Keep England informed of the success of free enterprise. That may help to prevent the creeping paralysis of Socialism destroying American prosperity.—Brigadier General Wade H. Hayes, managing-director, Edmundsons' Electricity Corporation, Ltd., London.

Selling Cost Ratios

Dealers in the area which calls itself the Inland Empire, that around Spokane, averaged a net profit of 10% of net sales during 1946, as compared to a net profit of 2% taken as typical in an *Electrical Merchandising* survey of 24 stores in 1939. This was disclosed by the first of what are intended to become quarterly surveys of costs and profits conducted by Robert Wilkinson, executive secretary, Inland Empire Electrical Dealers' Assn.

This high return on sales, despite a lower margin (an average of 27.1% for the Washington dealers as against the 35.1% margin reported by the 24 dealers in the 1939 survey) was due to much lower operating and sales expense. The average selling expense was only 4.8% of net sales as against the 1939 survey average of 14%. Other operating expenses were also lower. Occupancy was about the same—3.4%. Administrative and general was 8.8% as against the 1939 12.1%. Compensation of salesmen as only 3.1% as against 7.7; advertising and promotion .8% as against 2.8%; other selling costs .9% as against 3.7%. Total operating expense, including sales expense, was 17.1% as against 33.1% in the 1939 survey referred to.

In his letter to manufacturers of appliances, enclosing these figures, Wilkinson points out that selling expense in normal times will again represent about a 9.2% increase if commissions are to be paid salesmen, advertising is done and promotion conducted. If they keep operating efficiency high and expense low, with that 9.2% additional load, operating expense total will reach 26.3% leaving but a net profit of 8/10 of 1%, not enough obviously to kee from going broke. To continue to ope ate at the 1946 ratio of discount wi result in drastic curtailments of adve tising and sales personnel, a conditio that will be harmful to the entire in dustry.

How to use a recorder in business is well developed by Service Electric Suppl Co. at San Jose, Calif. Its salesmen are out in the field after business when mos of the factory men visit the office. So Gilbert has all visiting factory men give message about their lines into the microphone of a portable home recorde and when the boys come in from the field the platter is played to them. Or i may be kept for the regular sales meeting. Gilbert even takes it to convention and similar places with him. Thus he gets the prominent speakers to make platter about their talks so he can take them home for inspiration of the sta

Utah's Centennial crowds are visiting Utah Power & Light's farm electrification tent show, for it is at the state fair that has been given an extra long run this year. After that the tent and the electric farm equipment loaned b dealers, will play the stock shows and county fairs unt late this fall—a record run in all since its start years ag

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ELECTRICAL WEST Sales Guide

NEWS LETTER FOR THE ELECTRICAL MERCHANT OF THE WEST

Midmonth
August
1947

©

San Francisco Market

Market Week opened in San Francisco upon a scene reminiscent of that time all the relatives came to visit just as you were moving. The rugs weren't down yet, nor the drapes up, but you did your best to entertain them. So at the Mart. Exhibitors had just been able to move into the large new wing of Western Merchandise Mart this week before or play musical chairs and shift to a different floor or location as someone else moved. It's remarkable they had so much to show to the crowds that came pouring in on Monday, Aug. 4. Not as big crowds, nor as buying minded as previous markets, but those attending were rewarded with many new things to see. There were no dinners nor meetings but a large number of top executives from factories were there to meet dealers and talk to them personally. The informality of it was welcome. Here are highlights:

Certified lamps

Mike Swoyd with a complex Lionel train system kept crowds watching the switching. A toy train system is now quite a sizeable unit sale. First showing of Certified Lamps was made by Milo Lamps, and of Marbo lamps by Mark Soloman. Lloyd Levy also "proudly displayed" certified lamps. Marvon-Williams, who also showed the Conlon ironer, will have Greenspan certified lamps later. . . Milo lamps included some new floor lamps with circline and indirect combinations. . . Coronet Industries displayed a fluorescent lamp bracket for over a sink or working surface.

The majors

Westinghouse leads with possibly the swankest modern display. It has a new location on the corner of the 4th floor, has fully operating electric kitchen and laundry, a section devoted to its new kitchen planning service, and appliances arranged in its recommended curved line displays. . . Brightest display is that of General Electric with its 75 fc. from rows of continuous F-lamp units. Supply Co. lines, including much more than G-E itself makes, were also featured. Farm electric equipment again was prominent. . . Hotpoint in ample space on 5th floor but not yet fully equipped. . . Kelvinator with a beautiful new Morton kitchen and Fowler's new table top water heater. . . Crosley showing a live model of its superdeluxe combination television, FM, AM and phonograph. . . New things to be seen were: Frigidaire's new automatic washer. . . A new tray washer, called Traymaster, with streamlined works and a timer. . . Telechron's newly designed radio and alarm clock. . . Dalco Appliance showing the new Dishmatic electric washer with a 2 gal. water heater built in to either boost water temperature or provide

What's new

Dishwasher

hot water itself. . . Also showing the Frostair combined 7-ft. refrigerator and freezer with separate chests and separate compressors, made by Liquid Carbonic and General Tire. . . Insinkerator disposal. . . Proctor automatic toaster. . .

Small range

Nesco's new model Nesco Chef, wired for 220-v. to operate both surface elements and roaster oven-grill simultaneously; an immediate answer to the LPG competition. . . Thermador's new built in range, with separate surface units and oven, in Frank Edwards exhibit, along with Deepfreeze's new deluxe rectangular boxes. . . Sperti's germicidal lamp unit in addition to its sunlamps, at Fred Wood's new display; together with Casco's long needed sinus heating pad and its new power tool kit; and the Sparton vaporizer, an UL labeled device for winter colds. . .

Health

Recorders

Along with its Norge new ranges, new Bendix ironer, RCA models, the Leo J. Meyberg Co. showed a new Webster wire recorder, Brush tape recorder, a Oster blender with a removable mason jar feature. . . Schuyler-Wilson with swank new quarters and south seas atmosphere tied in with its Hallicrafters world wide expedition, made live pitches on the WasteKing disposal and Knapp-Monarch blenders. . . Thor has simplified the control on its Automagic washer, made it mechanical. . .

Heater-fan-grill

Meier and Murphy had several new lines: Kord Mfg. Co.'s Kordette table stove with cabinet and a heater with fan that doubles as a grill; Frigid line of commercial and industrial fans; Main Electric Co.'s industrial beam lights; Reliance automatic time switches, Central Porcelain's line of knobs and tubes; Mixquik drink mixer; Rotisomat, which electrically turns the spit and cooks the chicken or roast. More details and pictures will be in the September Electrical West. Also look for the analysis of a real problem, "Damaged in Transit—Who's to Blame?"

Whodunit

Prospects

The outlook for Christmas merchandise, as gathered from the Market-Deliveries will be a little better but hard to get items will still be slow and in insufficient quantities—automatic toasters, waffle irons, ranges, refrigerators. There will be enough lamps and table stoves and cleaners.

Heat helps

Electromode, getting ready for the fall and winter heating season, has a whole kit of sales helps for dealers, including ads, publicity, literature, etc. It has a new booklet for consumers, "Plan for Perfect Heating" which features its portable and built-in heaters and their applications.

Laundry plan book

What others have done for the kitchen planner, Bendix Home Appliances has done for the home laundry—that is, made up a deluxe "Architects' Handbook" on home laundry planning. Contains basic data on locations, blue prints with dimensions of equipment, color pictures of finished laundry rooms—11 different kinds, upstairs, downstairs, or garage.

Protectio

Stromberg-Carlson promises its dealers that it will make no price cuts without giving its dealers 30 days notice in which to sell the stock on hand.

New make

Lectro-Speed is the name of a new brand of electric water heater made in Portland by E. Potter and L. Kaplan, at 3025 SW First Ave. It is made in 5, 15, 20 and 42 gal. sizes, with Chromalox units, galvanized steel tanks, fiber glass insulation, aluminum jacket.

Long reach

That television can be received in San Diego from Los Angeles stations on a reasonably staisfactory basis was reported to a meeting of the Electronics Division of the Bureau of Radio & Electrical Appliances of San Diego County by Ivan Lauritzen, its chairman. San Diego radio technicians have tested it out with several sets at a variety of locations over the last 10 weeks. Its quite an encouraging picture for dealers, so read the details in next month's Electrical West.

Alert!

National Radio Week this year will be between Oct. 26-Nov. 1, and will be ballyhooed by the biggest combination of radio broadcasting talent in the business. Might be a good hunch to plan now for your tie-in.

Another line

White Cross has a new automatic electric iron to sell at $10.95, equipped with cooling fins and a cast-in element in the sole plate. Made by National Stamping & Electric Works, a subsidiary of Eureka-Williams Corp., it will have separate distribution from the latter's cordless automatic irons, which is now in full production.

After style

Motorola, with 27 models, is going hard after the home radio field, and will use the popularity of its auto radios as a springboard. Because it feels people take radio for granted and shop for style, it will stress furniture style in its cabinets rather than mechanical features.

Combination ranges

Monarch too has come forth with a kitchen designing booklet for consumer use, showing several kitchen arrangements with its various styles of ranges. The featured range is that with two ovens, a roaster-size surface oven in the cooking top and a "Deep-Heet" side and bottom heated sunken saucepan, as well as temperature and time controls, etc. Another model, a combination wood-coal and electric range uses the electric heat, via thermostat, to keep the oven heat uniform when using solid fuel.

Pay ruler

How to pay your salesmen is solved for you by Frigidaire with its clever new Frigidaire Compensation Selector, a circular slide rule affair on which a dealer sets his quotas, sales costs, and then can read off the basic salary, the commission rate, the monthly and yearly bonuses for each salesman. Saves hours of mathematical headaches and can even be applied to all lines in a store. Will be sold to Frigidaire dealers for around $3.

Pardon please

The typewriter slipped in reporting the price for Frigidaire's new electric dryer, last month. It should be $229.75, not $299.75—a $70 difference.

Assurance

Jacobs Launderall has told its distributors and dealers that it will guarantee them against a price reduction until Oct. 25. If one is made dealers will be reimbursed.

Fan heater

Fan-Glo Heetaire is the name given a newly announced built-in wall type electric fan heater made by La Salle Lighting Products and Market Electric Products, of Buffalo. It uses Neo-Glow elements, a glowing bar type of element with wire wound in a refractory. Wattages go from 1250 to 2000 in 115-and 220-volt sizes.

Hoover Co. has pulled the wraps and now announces a new cylinder type vacuum cleaner, Model 50, which has a number of refinements in design. Among them are a dirt removal idea, toe operated switch, positive attachment of cleaner hose and parts. Likewise Hoover introduces a new automatic electric iron with many design details of interest. Comes in two weights, 4¼ and 3¼ lb.

Branching out

Lots of promotions and changes in the Hotpoint organization, even in the West. Howard Scaife, regional manager, has been taken back to Chicago to be manager of sales development and until his successor is appointed V. E. Koch has been made district manager of both the Los Angeles and San Francisco districts. Bill Garrison leaves to become manager of dealer development activities for Hawaiian Electric Co. Hal E. Silvernail becomes sales promotion man for Graybar in San Francisco.

Boiling Hotpoint

J. C. Wilson & Co., once Bendix Radio representative, has been named factory representative for M. M. Hedges Mfg. Co., of Chattanooga, making the Mertland electric water heaters, in capacities from 10 to 80 gal., including two new table top models of 35 and 50 gal. size. Wilson also handles Wastemaster garbage disposal unit, made by Lockley Machine Co. of New Castle, Penn. for the 11 Western States. Wilson displayed these lines at the summer market of Western Merchandise Mart, where he makes his office.

Water heaters

Many who attended the Chicago market last month said it was quite a disappointment to the exhibitors. Not the attendance nor the buying, and those who attended came to voice gripes about deliveries, quality, shipment damage or discounts. Shoe is on the other foot now.

Cryers market

Westinghouse Lamp has developed a new carton for merchandising of lamps in cartons. In four sections, each holding three lamps, the sections can be torn apart to enable selling by units of at least three. Will be used on the household sizes, from 25 to 60 watts.

Tear off a lamp

Credit men in a recent meeting in San Francisco looked with their glass eye at the future and don't be surprised if they become insistent on payment and go a little more rigid on credit granting.

Cooler credit

Entry of Sears Roebuck & Co. with stores into British Columbia, where before this it has only maintained mail order offices, is causing a stir north of the border. If successful in Vancouver and Victoria it may be spread across Canada. Sears has enjoyed immunity from having to have its appliances passed by the Canadian Standards Assn. under the old plan; may not escape through the import regulations if it establishes stores.

Into Canada

Price increases were regretfully announced by two more of the majors--Norge with from $10 to $20 on four models of refrigerator in the lower price range; Frigidaire did do last month on both refrigerators and ranges.

Up they go

For the hobbyist a new line of power tools is offered by Boice-Crane through its distributors, Atwood Machinery Co. of Los Angeles, which company also lists a large stock of fractional horsepower motors.

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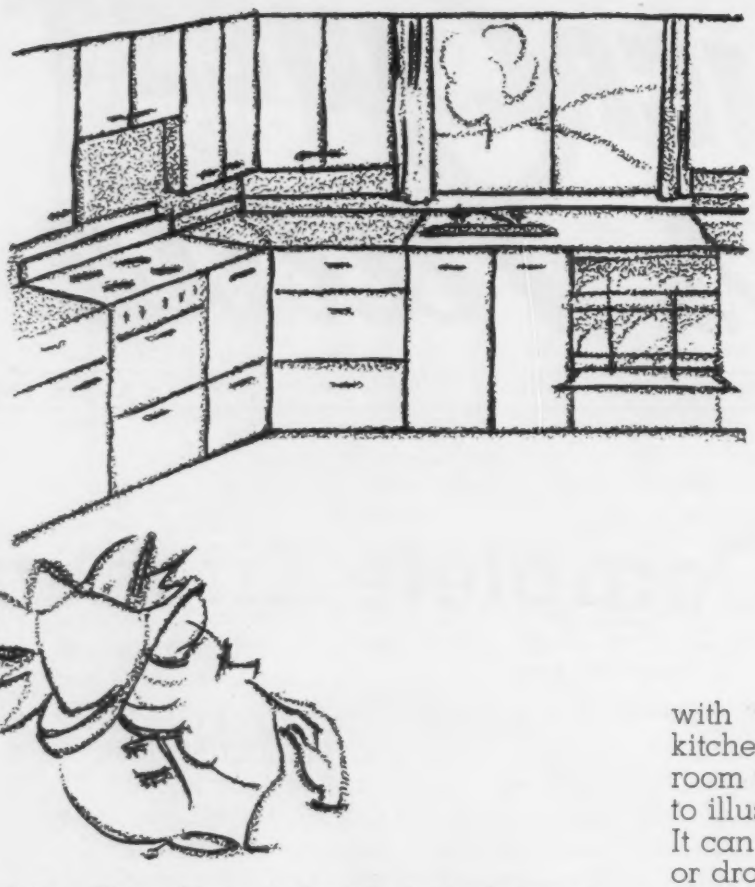
ELECTRICAL WEST
Sales Guide

FOR THE ELECTRICAL MERCHANT OF THE WEST © August, 1947

To Sell The Complete Kitchen

There's a knack to selling the complete electric kitchen. It is not a difficult one. Chiefly it takes the right point of view. Working from that, and organizing the details, brings any good salesman success and one sale made satisfactorily is the best prospect builder for more customers. This is no mere theory. It has worked for many dealers who have developed the kitchen business to a very profitable one. One of these is Adrian B. Greenberg, manager of the appliance department of Union Furniture Co. in San Francisco. He has made kitchens a specialty and a hobby. And now those he has sold bring new customers asking that he design and install new kitchens for them too. He says there is a knack to it, a point of view. So he was asked to share that point of view, the knowledge that makes that knack, with other dealers through this Sales Guide. On the inside pages you will find his methods described. They may be, or should be, just as effective for you in selling complete kitchen installations. Interest in kitchen modernization is high. Manufacturers' advertising in national magazines, stories in women's publications, newspapers and direct mail have keyed this interest to a high pitch. In answer to one advertisement in a San Francisco daily offering a kitchen booklet on kitchen planning, Adrian Greenberg had 236 replies in the two weeks that followed, and they came from all over the state.

It is not only those contemplating building new homes who inquire. A large number come from people wanting to remodel their homes. Denied the chance to spruce up their homes for so long, women are eager for new surroundings. It's a new kitchen they want nowadays. The market is really here—and now.



How One Man

Ideas any good salesman

Adrian Greenberg is fortunate to have a name like Adrian, with which to sign the kitchen plan he hands to his customer. It gives the final flourish and touch of style to the plan that women like. It is one of the subtleties of selling to women, no doubt, as evidenced by the signatures on perfumes, gowns, and other class and style merchandise.

But it is only the final signature, and any good salesman or dealer who wants to develop a real business of complete kitchens must also make many other preliminary steps before the signatures go on the plans. This is the advice Adrian gives for the successful selling of kitchens:

1. Study up on kitchen planning. Read the booklets or courses the manufacturers of major appliances and kitchen cabinets have prepared. Get familiar with the three or four types of kitchen, the locations of food receiving or storage center, preparation center, and serving center. Get familiar with the dimensions of cabinets, appliances, etc. Organize and simplify this information so you can refer to it and use it quickly.

2. Put in a model kitchen. This will serve many purposes. First it will acquaint you with the construction details of a real kitchen. Then it will serve as your showroom to which you can bring the prospect to illustrate what the kitchen will look like. It can thus take the place of a color sketch or drawing later on. In the store it can be used many ways, for demonstrations, cooking schools, etc.

3. Advertise your planning service. Let the community know you are equipped and ready to give tailor-made kitchen planning service to those who want it. Use a coupon to bring inquiries for kitchen plan books.

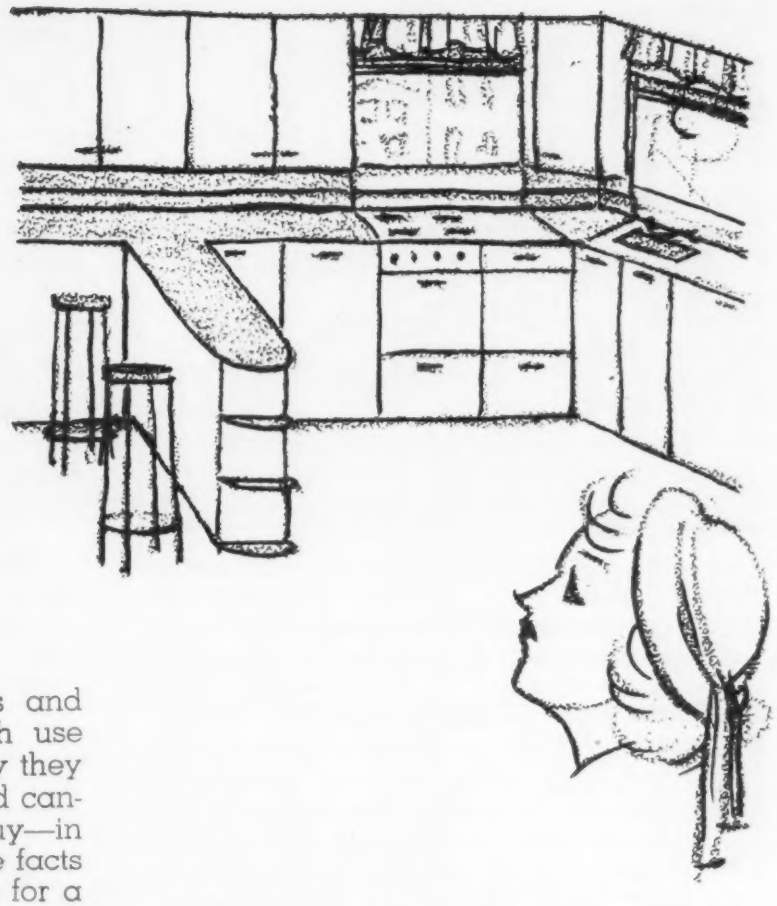
4. Write personal letters to prospects. In answering coupon requests for booklets Adrian writes a personal letter, stressing the theme "Design for Better Kitchen Living" and ends the letter, "Feel free to phone or correspond with the writer and we shall be pleased to answer your questions and assist you in the planning and preparation of your kitchen."

5. Make a personal call. To those who ask for definite kitchen planning advice and seem serious about it, make a personal call. Show this personal interest in the prospect.

6. Study the customer's needs. The door being open, look at the kitchen itself, size up its shape, arrangement, doors and windows, structural character and the condition of its appliances, sink, etc. Learn all

Sells Kitchens

can use to sell complete jobs



you can about the family's needs and wants in order to gage how much use they make of the kitchen, how many they feed, how much cooking, baking and canning is done, how they like to buy—in quantity or as they need it. All these facts give clues as to whether to provide for a freezer, a bigger or a small refrigerator, what size range, how much storage space is required.

7. Sketch a plan. On squared paper, make a rough sketch of the floor plan, noting the measurements, location of doors, windows, plumbing, sink, etc. Note the height of each window above the floor, for it might affect the placing of appliances under one if the window is low, or cause some structural changes. **Avoid structural changes,** Adrian advises. And be honest with the customer. If you can't make any improvement in the kitchen without heavy changes, tell the customer so and advise a new paint job or some appliance replacements. From your own list price sheets give an estimate of the cost of the new kitchen equipment—appliances, cabinets, and a separate estimate of the installation cost.

8. Sell the dishwasher-sink first. Build the entire new kitchen around the dishwasher and sink with a disposal. Don't try to sell it as a perfect answer to **all** dishwashing problems, or that it will do the pots and pans. But do show that it will save hours of unpleasant labor, save the hands from immersion in hot water, give dishes hotter and more sanitary washing, be easier on the dishes.

9. Make up a blueprint. Settle all the little details first—the colors, the kind of work surface wanted, the parts of a kitchen that are to be left in and the amount of refinishing. Do all this before starting to install. No kitchen ever quite fits the standard cabinet sizes, but there are filler units that can be used in the gaps. Get it all on the blueprints—three copies, one for the craftsmen or installers, one for the customer, one for your own file.

10. Schedule the job. Arrange the order of different parts of the work. First the carpenter, then the plumber, then the electrician, then the carpenter again for the finish. See that the merchandise is delivered and ready to install. Supervise the job yourself. It makes the customer feel better. Take care of little details. For instance some existing sinks are only 22 in. wide and the dishwasher is 25 in. Arrange that the new sink or working top extend over to make a neat job of it. Watch that the plumber puts a union and a shut-off valve where the piping goes into the dishwasher. Many plumbers will neglect this.

It means that the unit later can be serviced or removed without cutting off all the water in the house. A well scheduled job can be started in the morning and the people can use the kitchen equipment that night; in some cases the entire job can be done in a day. Adrian has worked with three contractors who want the work and are willing to cooperate.

11. Give good service. This is very important, Adrian believes. "We've never cried to the distributor about service. We've gone out and found out what was the matter ourselves. It has paid off. Now when a customer calls on the phone, by a few questions I can determine just what the trouble is and when the man goes to fix it, give him definite instructions. It saves money." And, said Adrian, such service pays in contented customers who are walking advertisements for you.

12. Contract for the equipment only. Unless a customer insists on putting the installation into one contract for time payments, Adrian makes the sale of the equipment a separate contract and lets the owner pay the installers separately. "I'm in the kitchen equipment business. I'm not a contractor," he says. That's why he sells the cabinets as well as the appliances, for they are merchandise too. However he feels that the dealer should see the kitchen installed as a personal service. It would be very poor salesmanship to merely sell the equipment and say, "Here it is, you go get it put in."

12. Personalize the whole transaction. A new kitchen is a pretty important thing in the life of your prospect, Adrian has sensed. The prospect appreciates the custom-tailored aspect of a kitchen designed just to fit her very own needs. By seeing it through personally from beginning to end Adrian builds a satisfied clientele who refer their friends to him for similar personal treatment. If the customer is building a new home and has an architect working on plans, Adrian works with the architect, furnishes him with specifications and layout data. Selling a kitchen, he feels, should be a one-man project; it should not be handed from salesman to some one else. If a salesman or dealer wants to make a success of it let him follow each sale he starts on right through personally. Let other salesmen in the organization do the same. Keep it personal.

This has all been about the sale of kitchens to individual home owners. If the dealer does not get busy and initiate the sale of unit kitchens to builders of new tracts of houses then the manufacturer cannot be blamed if he tries to go direct to that contractor. This is a little different from selling a kitchen to an individual. But where the dealer has the edge is that he can offer to service what **he** sells and guarantee users satisfaction .Be alert and sell the builder before he starts seeking a dealership himself, which he is not really entitled to have.

This type of mass sale takes a different selling program than that used by Adrian Greenberg, just covered. There is also involved in it whatever state or provincial laws there may be with regard to what can and what cannot be included in the mortgage and just what the dealer's position is in case of repossession and replacement. It is advisable to consult an attorney in regard to sales for replacement of appliances already covered by a mortgage, a situation that will arise in the future, perhaps.

Before the war most of the kitchen planning was done either by a utility company staff or the dealer was asked to send a floor plan to an Eastern factory where plans would be drawn. But now most of the makers of kitchen equipment are devising means whereby the dealer can make plans himself, right on the spot. This is to be desired and speeds up the whole transaction for everyone.

A complete kitchen makes a sale that is big enough to warrant special effort.

Rural Party

A big family party was held at the remote Wilsona schoolhouse, 25 miles out in the desert from Lancaster, Calif., when the Southern California Edison Co. brought power into the district for the first time. Dealers in Palmdale and Lancaster brought over exhibits of appliances. Wholesalers in Los Angeles backed them up with stocks to take care of their new farm customers. Members of the Edison Co. headquarters and Lancaster staffs welcomed their new rural district and explained their policy in regard to extensions and dealer sales. And everyone was given a Reddy Kilowatt pin. Ice cream, doughnuts, coffee and soft drinks were served to the 150 people, members of the Wilsona Improvement Assn., who attended.

Wilsona Improvement Assn. originally had formed to get REA funds for a public utility district. After some negotiations the Edison Co. made a more beneficial contract and put all pressure on its crews to rush the new lines to completion. The party to celebrate the coming of electric service cemented the fine relationship between farmers, dealers and th utility company. R. A. McFadden, commercial manager, and Gale Lanning, Lancaster district manager, were hosts.

Dealers from Lancaster and Palmdale brought appliances for them to see

Retailers Conference

Among the 21 retailers representing their branch of the industry to meet with 20 representatives from leading manufacturing companies in a joint conference sponsored by the National Electrical Retailers Assn., at Chicago, last month were three Westerners, Harold Taylor of Pasadena, Herb Names of Denver, vice-president of NERA, and C. E. Price, of Price Bros., Los Angeles. Names, as chairman of the wholesaler-manufacturer relations committee, presented the report prepared by the NERA group, setting forth the retailers' views and wishes in respect to some of the distribution questions affecting them all.

Pledging their cooperation to manufacturers the NERA asked in turn that manufacturers (1) stop franchise abuses and overfranchising in markets that cannot absorb dealers; (2) become realistic about advertising helps, designing them to fit dealer stores and pocketbooks; (3) channel sales to builders through franchised dealers rather than set up builders as dealers; (4) provide at least a 40% trade discount so that dealers will be able to afford selling expense, advertising, etc.; (5) provide more adequately for servicing expense; (6) control "back-door" sales and company-employee discount deals; (7) use descriptive tags on appliances; (8) help block the co-op free tax ride and especially in rural electrification distribution; (9) fair trade their prices; (10) watch model protection; (11) assist in reducing installation costs; (12) cut out tie-in allocations of merchandise.

The Chicago NERA meeting also decided on a new dues basis for members, a retail sales volume basis rather than a straight $25 a year. In the West the field staff reports a total of 39 chapters in Colorado, California, Oregon and Washington.

● A COST indicator chart, somewhat like a slide rule, is being perfected by Utah Power & Light Co., says W. A. Huckins, sales manager, to give all dealer retail salesmen something authentic and uniform to use in talking to customers about the cost of operating appliances. The salesman can ask the prospect, "What's your bill running now?" look on the top column, for that amount, then look down for the additional monthly average cost of the appliance about to be purchased. The chart is titled, "Estimated monthly wages of additional electrical servants in your home." The chart won the gold award from the Advertising Clubs national contest as the best direct mail novelty piece.

● RETURNED to life after the war is the little consumer-directed publication, *Selling With Light*, published by Ted Birchard of 2030 Westlake Ave., Seattle. The publication was started before the war and suspended, along with another, *The Electric Chef*, also published by Birchard which is used by utility companies to distribute to their commercial cooking customers and prospects. The front cover of *Selling With Light* is localized for each company and there is printed on the back cover the company's signature. It is a self-mailing medium devoted to picturing the latest commercial lighting sources and methods. Birchard also plans to issue a similar customer mailing piece for utilities called *Electrical Era*, devoted to appliances and home electrification and designed to be sent to domestic customers.

● How you can sell more commercial electric cooking equipment, is the title of a well-designed booklet of 64 pages published by Electrical Information Publications Inc., of Madison, Wis. It is written by D. W. Grosshandler and W. H. Merrifield in such a way as to supplement the basic training courses such as that of the EEI-NEWA by outlining in usable form the "what it is" and "what it does" advantages and how accomplished for each commercial cooking appliance. More than that it groups conveniently the market information, sales techniques, making of layouts, servicing and other useful sales tools for the heavy-duty salesman.

● CURRENT PLUGS is the name Pacific Power & Light Co. has given a new mailing piece it sends its "livewire electric appliance dealers" as a selling stimulant and to report back to them the totals of appliances sold in its various districts and areas. A recent number carried the totals from 341 dealers, bringing the estimated dollar volume of the year to date at $2,310,206.

Of the 100,000 or more who attended the show about 12,000 participated in the contest which gave Blue Line Electric Co., contractor-dealer, a fine prospect list for the Hotpoint kitchen and Laundry, other appliances and its own Tritex wiring in three colors, which this enterprising firm displayed in one busy corner

Raytheon showed for the first time a new home precipitator in two models, a compact circulator unit to catch the dust from the air it circulates through it in a room, and a furnace-type unit, self-washing that can be assembled in the air lines of anyone's furnace. A. E. Randklev, Raytheon representative, stands between the two

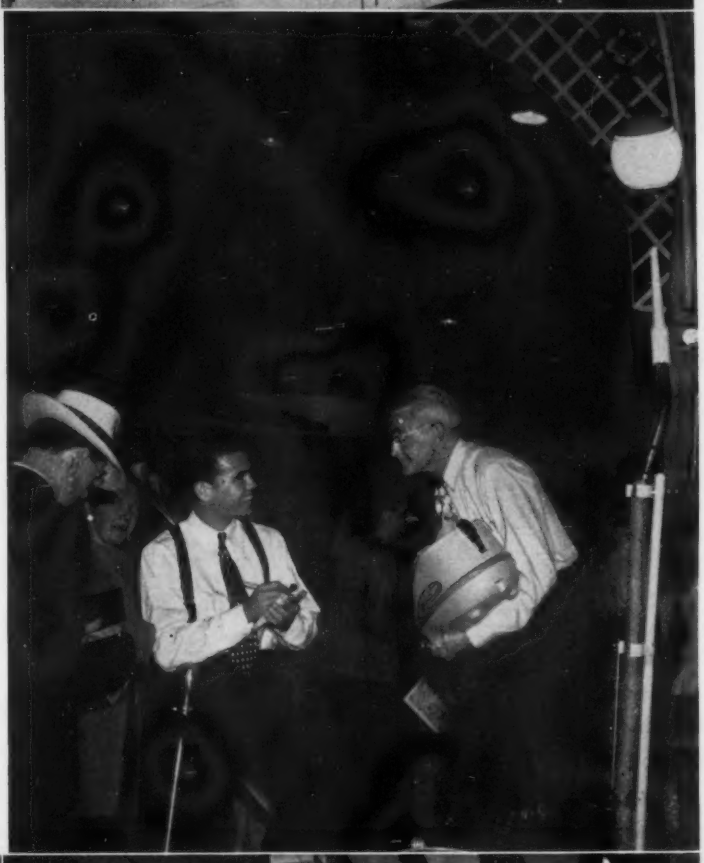
EVERYBODY PUTS ON A "PITCH" AT THE LOS ANGELES HOME SHOW

First time shown in the West was the Ingersol utility unit, a compact package containing furnace, water heater, all plumbing and wiring to which a Norge kitchen is fitted on one side, a compact bathroom on the other. Bandoli-McIntyre Co., its distributor, with a double-sided exhibit, attracted real interest to it A. Olson and Miss M. Perner attended display

Westinghouse showed its full line, from kitchens to comforters, with attractive displays designed by S. E. May of Wesco. "The housewife" holding the Circle W went around in circles, and no wonder, with such an array of appliances. Across the aisle U. S. Grant also had a huge exhibit with Federal radios and Grant's own line of freezers and large scale refrigerators

Frank Helderle, Stewart-Warner regional manager of radio-radar, demonstrated actual operation of AM, FM and television to large crowds in one of a long line of Kinney Bros. displays that included freezers, steel and hardwood kitchen cabinets, Saniway disposals, Knapp-Monarch appliances, McAlister vacs, Tru-temp irons

Above, right: Thermador sprang its 1947 model Bilt-in electric range which saves shipping weight and crating by being in separate oven, cooking top and grill units. At right, Typical "pitch" direct sales being put on by Interstate's Charlie Haines and E Gilson for its Compact vacuum cleaner and house cleaning accessories

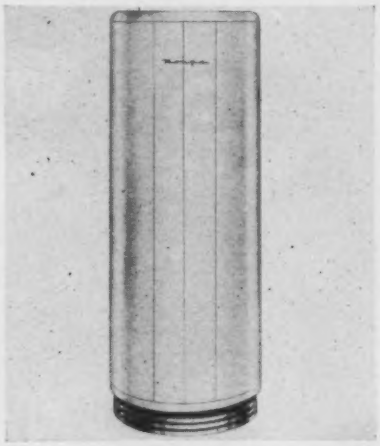


Crowds watched the continuous demonstration of the Waste King pulverizer, put on by Given Mfg. Co. and Gough Industries, and "Waste King" himself delighted the kids The public was invited to try some garbage themselves. Distributor Gough's dealers took turns in the display. Bottom: Meyberg's big display had centers for RCA, Norge, Bendix, Eureka, Domestic, kitchens

APPLIANCE PREVIEW

Water Heater (831)

Norge has entered the electric water heater field with five models, including 80-, 66-, 52-, 40- and 30-gal. sizes. These units are of the round, upright type, are finished in high-gloss baked white enamel and are insulated with 5-in. thickness of glass wool. A single or double nichrome heating element is available, depending on local practices. The units are completely automatic; have fingertip control for simple temperature adjustments; feature a diffusion baffle to prevent mixing of inflowing cold water with that already heated.



Iron (832)

The new Yale Tip Toe iron features a hinged sole plate, which permits the toe to be used for gathers, ruffles, etc., while the rear is raised off the ironing board. Each sole plate has a cast-in heating element. This iron weighs 3 lb., 2 oz. Sole plate is 29 sq. in.; toe area is one fourth of total. A 10,000-cycle reversible cord provides for left- or right-handed operation. The thermostat is placed for finger-tip adjustment without lifting the hand from the iron handle.

Appliance Tester (833)

Simpson Electric Co. offers an electrical appliance tester, Model 390, giving voltage, amperage and wattage readings in an instrument about the size of a man's hand and no heavier than an average novel. It has a break-in plug with four color-coded leads. When connected, voltage readings will register immediately; to get wattage or ampere readings, it is necessary to press the proper button on the instrument panel. Ranges a-c, 60 cycles: volts, 0-150, 0-300; amperes, 0-3, 0-15; watts, 0-300, 0-600, 0-1,500, 0-3,000

Singer (834)

The Singette, an electric tool claimed to do such varied jobs as singeing fowl, browning casserole dishes, grilling sandwiches, removing paint, is offered by Henry J. Morton Associates. This device has a high-temperature heating element shielded with a chrome-plated hood; insulation forms a heat barrier between head and handle. It can be used on a-c or d-c; rated at 650 watts. Comes with nickel-plated stand.

Disposal Unit (835)

The new Drain-O-Matic, manufactured by the Rousselle Corp., features two-directional operation of shredding elements; increased life; double cleaning and flushing action. Operation is said to be satisfactory with any type municipal sewage system or a 500-gal. septic tank; unit fits sinks with 3½- to 4-in. drain openings. The unit has a ¼-hp. motor; operates at 1,725 r.p.m. on 115 volts, 60 cycles a-c. Overload protection is provided. Weighs approximately 45 lb.

Insect Killer (836)

An electric insect killer, the Bugmaster, is available from Engineered Products Co. It is said to be effective indoors or out; will take up to and including a 200-watt lamp; operates on 50-60 cycle, 110-120 volts, a-c. The unit consists of a lamp in a metal cage; kills by electrocution.

Roaster (837)

National Enameling and Stamping Co. is in production with its Model 109 automatic electric roaster. This Nesco roaster features a built-in time clock which turns the appliance off and on automatically. Another feature is the insulated stainless steel cover, said to reduce heat loss to a minimum. Like other Nesco roasters, the 109 has an automatic thermostat with signal light and a cover-raising mechanism. Body and bottom are heavily insulated with glass wool. A 3-piece porcelain enamel pan set, 64-page recipe book and cord set are standard equipment.

The 109 operates on 110-120-volt a-c and is approved by Underwriters' Laboratories.

Air Circulators (838)

Motionair Mfg. Co. is again making indirect air circulators. In operation these units send a column of air to the ceiling, where it is deflected in all directions, then travels downward. Made of cast aluminum, and equipped with a carrying handle, the Motionair has a 12-in. blade. propelled by a 1/15-hp. electric motor. A two-speed switch permits heavy drive to establish circulation and a half-speed drive for maintaining circulation.

Food Mixer (839)

Miracle is showing a new portable food mixer which is less than 2-⅛ in. thick, weighs 3 lb., can be used for on-the-spot mixing during cooking process. This unit beats, stirs, mashes, mixes and whips. It has a 5-speed governor-controlled motor with thumb-touch control. Beaters are stainless steel, have a double beating action; drop out for cleaning when a release lever is pushed.

Cooler (840)

A new window-type cooler has been put into production by Palmer Mfg. Corp. This unit has metal fill-ins to fit any window adjustable from 24 to 34½ in. wide. Adjustable directional louvers, motor and water switches on the cooler front give control from inside the room. The cabinet is 22-gage, rust-resistant steel. A 16-in. fan is powered by 1/2 hp. motor.

Clock (841)

General Time Instruments Corp. has announced the Westclox Oracle, to retail at $15, plus tax. Standing 6¼ in. high, this model has a glass- and gold-covered metal case and silver dial. It is available for distribution on a quota basis, the company reports .

Lighting Bracket (842)

A new Mastercraft wall bracket is designed for bathroom, kitchen, game room and occasional lighting in homes and for use in commercial establishments. This bracket is made for a 14- or 15-watt F lamp; is of steel finished in chrome plate; convenience outlet is optional.

THE FINEST NAME IN ELECTRIC COOKING

Since 1929

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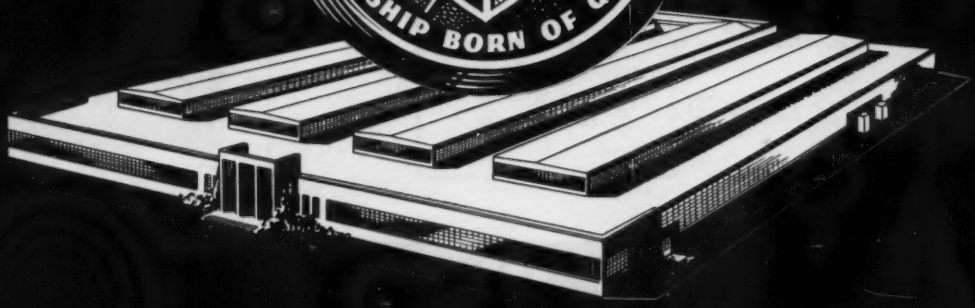

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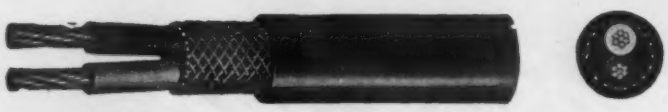

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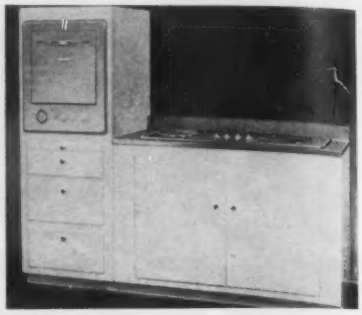
Built-in Range (843)

Thermador's Bilt-In range is a compact, stainless steel- one-piece unit with a separate, standard-size, stainless steel oven. Both units are installed as permanent fixtures in any part of the kitchen, at any preferred height, to conform with individual needs and structural limitations. The cooking unit is set into the counter top and combinations of extra ovens and extra heating units may be installed.

The cooking top consists of three heating units and a 5-qt. deep-well cooker, measures 17½ in. wide, 45 in. long, with a ¾ in. rise



for the switch panel. The rough-in box is 10¾ in. deep and the whole is installed in a cabinet to builder's specifications. Installation is said to be simple.

Units will be equipped with five-heat switches or with infinite control switches. The switch panel is to the front of the cooking top.

Oven front measures 20 in. wide and 24 in. high and fits into any cabinet with an opening 16 in. wide, 15¾ in. high and 24 in. deep, with a small hole at the back for the conduit. Units are Underwriters' approved.

A built-in griddle, 27½ in. long, 17½ in. wide, with five-heat control will be available.

Hedge Trimmer (844)

An electric hedge trimmer is available from Sunbeam Corp. This tool has a 110-volt a-c, d-c motor, self-contained within the handle; weighs 4¼ lb.

Lighting Fixture (845)

A lantern fixture introduced recently by Lightolier Inc. has wind bowl and smoke bell, hand-cut frosted glass shade, pierced metal gallery, three candle lights. All metal parts are of polished Colonial gold with Bakelac finish.

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To any portable lamp maker who is employing the new circular fluorescent tube in his product, the vital need for good auxiliary equipment is evident. Specifically, customer satisfaction depends on the BALLAST.

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The word "CERTIFIED" on the ballast you use means that it is built to rigid specifications to assure satisfactory operation of a fluorescent tube in a portable lamp. Nationally famous Electrical Testing Laboratories tests and checks the product against these specifications . . . give it the stamp of approval. And CERTIFIED BALLASTS have long been the accepted standard in commercial and industrial fluorescent lighting. They're your best assurance of customer acceptance and good will.

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IDEAL *Distributed Through* AMERICA'S LEADING WHOLESALERS

Hot Dog Cooker (846)

Electronic Chemical Engineering Co. utilizes dielectric heating in its hot dog cooker, the Electronofire, which it claims will turn out a dog in ten seconds. This model uses four tubes; operating costs, including tube replacements, are less than 5 to 6c per hour, the manufacturer says.

Window Light (847)

Fluorescent Fixtures of California's Duo-Window-Lite is claimed to do a two-fold merchandising job—flood the entire window area and display an advertising announcement. This light is manufactured for four 20-watt or four 40-watt tubes.

Alarm Clock (848)

An electric alarm clock with a luminous case and face has been introduced by Telechron. It has an alarm which can be regulated low or loud and keeps on ringing until shut off.

Floor Polisher (849)

Toadroy Mfg. Co.'s new electric floor polisher is designed for household use, weighs 13 lb.; has 9-in. brush with rotory action; no pulleys or belts.

ELECTRICAL WEST, 68 Post St.,
San Francisco 4, California

Please send me information about following CIRCLED items:

831	832	833	834	835
836	837	838	839	840
841	842	843	844	845
846	847	848	849	

Name.....

Company*.....

Title*.....

Address.....

*Please include your company's name and your position, as we cannot ask manufacturers to furnish literature unless you do.

FUSE FACTS

about

TRICO

"Powder-Packed"

FUSES!

Here are just a few of the many advantages of TRICO Renewable Fuses...

- Tamper-Proof Protection
- Non-Interchangeable Link
- Link Support
- Safe Time-Lag
- Life-Time Outer Parts
- Guaranteed Results

For a more complete explanation of the above advantages—write today for your FREE copy of Booklet No. 206-A.

TRICO

TRICO FUSE MFG. CO. Milwaukee, Wisconsin

ECONOMICAL

Jeffries Transformers

Reasonable in Price
Reliable in Performance

Jeffries large transformers are priced reasonably—and you can save their first cost in a short time by minimizing current losses. When you use a Jeffries transformer, you can provide voltage change at the point desired, without prohibitive expense.

We supply all types and sizes. If not in stock, we build to order in a hurry—a week to 10 days.

Write today for catalog

JEFFRIES TRANSFORMER COMPANY
1710 E. 57th St. Los Angeles 11, Calif.

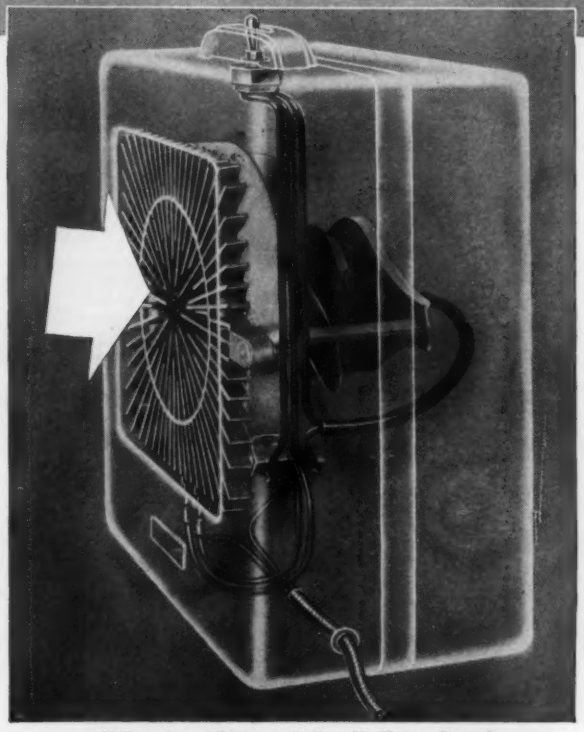
THE HEATER SENSATION OF THE YEAR!

ELECTROMODE

WITH THE EXCLUSIVE, PATENTED SAFETY-GRID

NO wonder buyers everywhere are choosing Electromodes—the only heaters on the market with the Safety-Grid—the exclusive, patented cast-aluminum heating element that has no exposed hot wires or glowing coils . . . that won't, *can't* cause fire, shock or burn!

Here is the greatest selling feature an all-electric heater ever had . . . *and only Electromode* has it! Dealers and wholesalers all over the country are cashing in on this quality-built line of all-electric heaters. Join the profit parade. Sell Electromode.



X-Ray view of Electromode Portable Heater shows the exclusive cast-aluminum Safety-Grid.

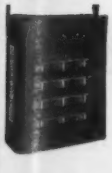
A COMPLETE LINE OF HEATERS OFFERING YOU *GREATER SALES AND PROFITS!*

PORTABLE ROOM HEATER. A sturdy "quality" heater that's completely safe for children. Combines lightness with compactness. Plugs in anywhere.

BILT-IN-WALL SMALL-ROOM HEATER. Easily installed in bath or any small room; requires no special wiring.

BILT-IN-WALL ROOM HEATER for homes or offices. Employs unique Down-Flo principle of warm air delivery. Manual or thermostatic control.

PORTABLE ROOM HEATER for home and office. Gives high BTU output; circulates warmth by Down-Flo principle.



STANDARD UNIT HEATER for industrial use. One of a complete line of Electromode standard and specialized industrial unit heaters.

A GREAT PROMOTION PROGRAM!

We back you 100% with a big, soundly-planned advertising campaign—Electromode Domestic Heater ads month after month in leading magazines . . . consistent Industrial Heater advertising in top business papers. And a complete, up-to-date array of sales promotion aids! Write Electromode Corporation, Dept. EW-87 for complete information.

ELECTROMODE REPRESENTATIVES:

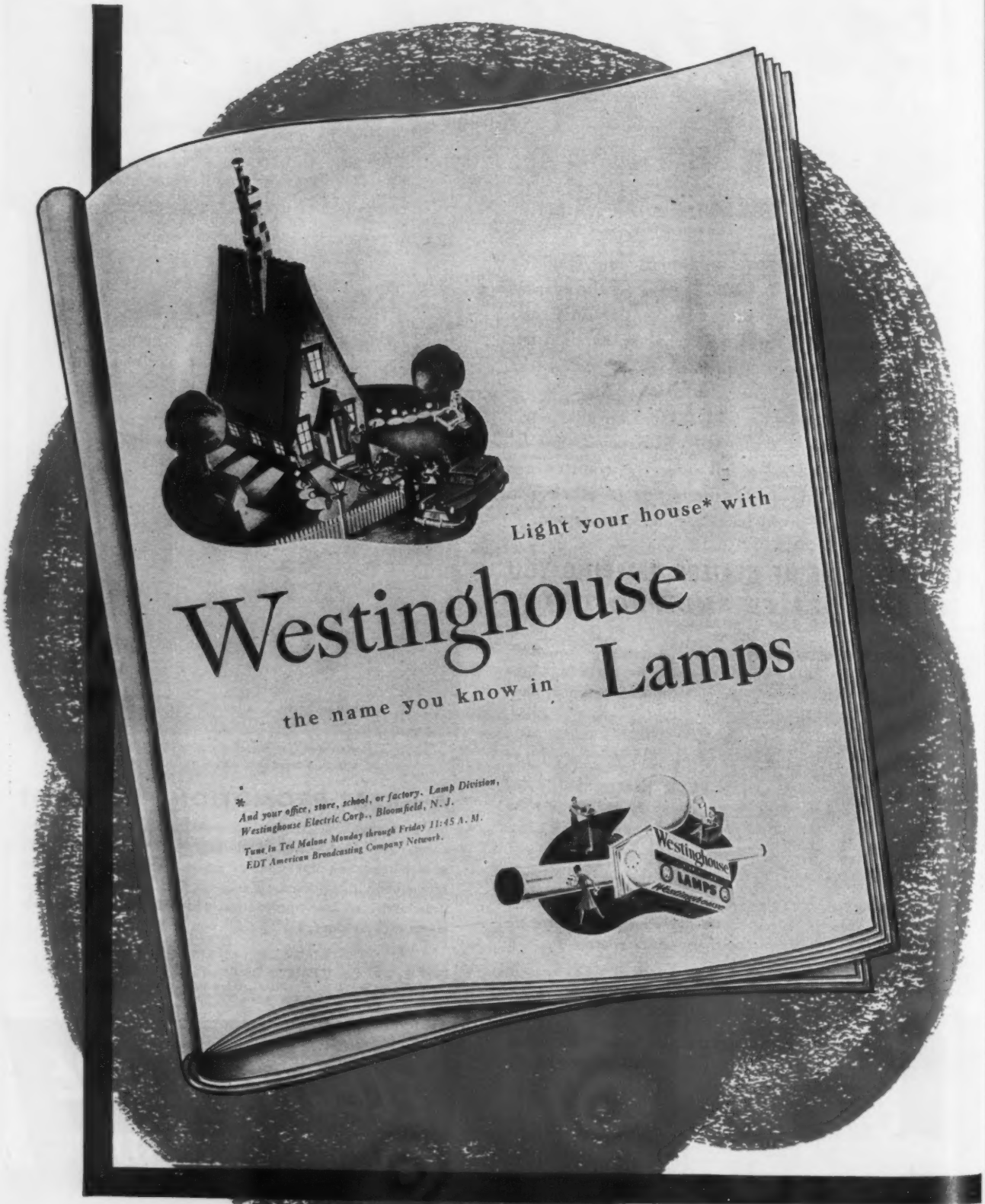
FRED W. CARLSON	HARRY F. HALDEMAN, INC.	RUSSELL & COMPANY
307 Wall St.	1106 S. Hope St.	1355 Market St.
Seattle 1, Wash.	Los Angeles 15, Calif.	San Francisco 3, Calif

ELECTROMODE *All-Electric* **HEATERS**

ELECTROMODE CORPORATION • 45 Crouch St., Rochester 3, N. Y.

WORLD'S LEADING EXCLUSIVE MANUFACTURER OF ALL-ELECTRIC HEATERS

Here's the LAMP

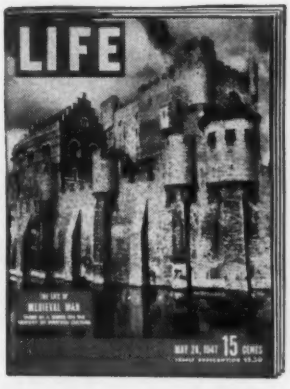

Light your house* with
Westinghouse
the name you know in Lamps
* And your office, store, school, or factory. Lamp Division, Westinghouse Electric Corp., Bloomfield, N. J.
Tune in Ted Malone Monday through Friday 11:45 A. M. EDT American Broadcasting Company Network.
Westinghouse
LAMPS

LAMP DIVISION,

CAMPAIGN

that will be building sales for you this Fall!

LEADING NATIONAL MEDIA!



13 INSERTIONS IN THE FIFTEEN WEEKS OF THE FALL BUYING SEASON!

Westinghouse lamp ads in full color will be blanketing the market. Watch for the first ad in "This Week" on September 14th and the full-color spread in "Time" on September 15th—and all the other ads week after week after that.

RAILROAD STATION DISPLAYS IN TEN LEADING CITIES!

A new natural medium for lamps! Will reach a circulation of close to 200,000,000 a year through three-dimensional displays in leading stations of the country.

TED MALONE ON ABC!

A lamp commercial every day Monday through Friday over the 197 stations of the ABC—reaches more than 3,000,000 different people every week.

AND COMPLETE SUPPORT AT THE POINT OF SALE!

Westinghouse—with a *complete* line of merchandisers—provides exactly the right kind of merchandisers for every store. A full selection of new displays ties in with the national advertising.

WESTINGHOUSE ELECTRIC CORPORATION

BLOOMFIELD, N. J.

THE MONTH IN BRIEF

Electric House Heating Rates

Controversy over increased rates for electric house heating proposed by Seattle City Light has been resolved by a compromise whereby the new rates will not become effective for present heating customers for five years. In addition customers installing heating before Dec. 31, 1947 will also be exempted from the higher rate until 1952. Under the new rates the first 1,200 kwh. will be paid for at the so-called all-electric rate which has a minimum step of 7 mills up to 2,500 kwh. However, in the future house heating customers will pay 1.8 cents for all energy above 1,200 kwh. Opponents have called the new rates "discriminatory and punitive." City Light Superintendent E. R. Hoffman has insisted house heating "must pay its own way."

Voters to Decide

Decision as to whether or not private power companies in Oregon may keep their hydroelectric developments for the license period is now up to the voters at the November election. An amendment to the 1931 hydroelectric law allowing retention for the license period was passed by the 1947 legislature over gubernatorial veto. Referendum petitions circulated by the state grange, Oregon Farmers Union and others contained 17,557 signatures; were filed the day before the new bill was to take effect. Presently affected is Idaho Power Co., which has applied for license to build a $12,000,000 dam on the Snake River in Oregon but is not expected to start construction until after election.

Advocates Power Marketing Agency

Advocating a permanent power marketing agency for the Pacific Northwest, before a Congressional committee recently, Kinsey M. Robinson, president of Washington Water Power Co., called attention to an almost forgotten provision of the Bonneville Project Act. The present BPA is set up as a provisional agency pending establishment of a permanent administration for Bonneville and other Columbia River projects. He pointed out that since the original legislation, most of BPA's authority has stemmed from administrative or executive orders without legislative sanction of Congress.

Northwest Salmon Runs

Fate of the age-old salmon runs of the Columbia and Snake rivers has been placed largely in the hands of the Columbia Basin Inter-Agency Commission. A department of the Interior recommended policy infers that after a 10-year moratorium on dam construction on the lower river during which the fishery problem can be studied, the salmon run "must, if necessary be sacrificed" rather than block full development of other resources of the river. Chances of resolving the differences between the fishery people and the power, irrigation and navigation proponents are considered remote.

Defies Taft-Hartley Bill

In a policy declaration bristling with defiance of the Taft-Hartley bill, the 5th regional executive committee of the Utility Workers Union of America, CIO, has urged its membership to boycott the NLRB, to revoke no-strike pledges in existing contracts, to defy the law's restrictions on political activity and expression and to ignore the no-Communist affidavit provision. Locals affiliated with the regional council have contracts with Pacific Gas and Electric Co. and Southern California Gas Co.

Another Merger Plan

Proposal for merger of Pacific Power & Light and Washington Water Power companies was filed last month with federal and state authorities. Under the plan, announced jointly by Kinsey M. Robinson, president of Washington Water Power, and Paul B. McKee, Pacific president, American Power & Light Co. would transfer the Pacific stock to Washington Water Power, would then sell its holdings in the Washington company, thus complying with the holding company act. Pacific would continue as a separate operating company having its own board of directors and management, with headquarters in Portland. No change in officers of either company is contemplated, it was stated.

Spokane Franchise Voted

Spokane voters granted a 14-year non-exclusive city franchise to Washington Water Power Co., by a ballot of 15,211 to 11,339. Under the franchise terms, the company will pay the city 1% of its gross revenue from electric sales, plus a 3% occupational tax, a total of approximately $160,000 a year. Additional concessions, including rate reductions for overhead street lighting and traffic signal lights, will save the city about $1,000,000 during the 15-year period. The company had promised to spend about $7,000,000 for service improvement if the franchise were granted.

PG and E Peak Nears 2,000,000 kw.

Pacific Gas and Electric Co. load is pushing 2,000,000 kw. Highest peak in system history occurred on July 22 when hot weather set farmers' irrigation pumps to working all at once. Demand on July 22 was 1,924,000 kw. up 185,000 kw. over 1946. Ability to carry this load was due in no small measure to some 250,000 kva. of capacitors installed recently. Present trends point to a system peak of 3,000,000 kw. by 1955.

Purchase Plan Accepted by Town

Purchase by Washington Power Co. of the municipal electric system of the town of Harrison, Idaho, was announced recently. A 25-year franchise was granted the company when the sale was voted. The Harrison system was built in 1921, power being purchased from Washington Water Power.

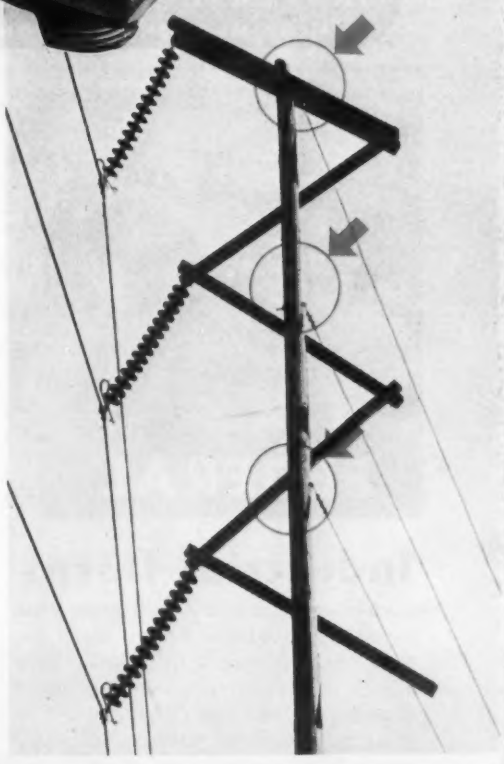
Turned Down by Co-op

Members of the Pend Oreille Electric Cooperative, on the other hand, voted against a proposal to sell their properties in Newport, Wash. to Washington Water Power. Vote was 172 against, 70 for the proposal.

Accompanying views sho realignment of main pow line necessitated by co struction of new 4-lan highway just outside North Sacramento, Cal

-With Hubbard Straight-Groove Guy Clamps on Pole Lines . . . .

In figuring the load and strain to be supported by guy wires—special consideration should be given to guy clamps—as no guy is stronger than its clamp. Contrasted to other guy clamps Hubbard *straight-groove* guy clamps provide maximum frictional holding surface. They can be cinched down without *nicking, bending, crushing* or damaging cable strands. Hubbard guy clamps can be installed singly or in multiples without dismantling or reassembling. Full protection against corrosion and weathering is provided by special Hot-dip galvanizing. For that *Extra Margin of Safety,* adopt Hubbard guy clamps as your standard. Order today or write for full details.



HUBBARD POLE LINE HARDWARE INCLUDES:

- Standard Pole Line Hardware
- Cable Material for Overhead Construction
- Communication System Hardware
- Electric Railway Hardware
- Street Lighting Equipment
- Rural Electrification Material

HUBBARD

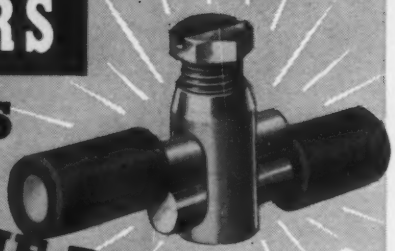
Hubbard and COMPANY

OAKLAND, CAL. PITTSBURGH CHICAGO

HUBBARD

HANG THE LOAD ON HUBBARD HARDWARE

BLACKBURN
Service Entrance
CONNECTORS



IT COSTS LESS
TO USE THE BEST!

IT COSTS LESS TO USE BLACKBURN!

BLACKBURN Service Entrance Connectors cost no more originally. In the long run—year after year—they actually *cost less*, because they *last longer* and give better service. That's due to their high-strength construction of DURONZE, which is over 50% stronger than hard copper or commercial bronze commonly used in the trade. Also, their circular construction gives them extra strength along the line of pull of the screw. Cut maintenance costs, with BLACKBURN Connectors!

Over 100 Conveniently-Located Jobbers' Stocks

BUILDERS OF QUALITY CONNECTORS FOR OVER 10 YEARS
JASPER BLACKBURN PRODUCTS CORP.
FIRST, MADISON & CLINTON STS. • ST. LOUIS 6, MISSOURI

Industrial Horns

electric or air actuated, will solve your signalling problems. Easily installed, these powerful, penetrating signals have a quick cut-off, may be coded to convey a variety of messages. Built to live in industrial locations, weather and water proof; heavy construction of corrosion proof metal insures long life, dependable operation.

FEDERAL ELECTRIC CO., INC.
8723 South State Street, Chicago 19, Illinois

F. M. NICHOLAS COMPANY
1123 Harrison Street, San Francisco 3, California

H. H. Van Luven
307-09 East Third Street
Los Angeles 13, California
MUtual 5173
Manufacturers' Representative
Representing

CONNECTICUT TELEPHONE & ELECTRIC DIVISION
Hospital Signal Systems — Annunciators — Intercommunication equipment, etc.

LENZ ELECTRIC MFG. CO.
Lead—Braid Covered Cables and Wires—Tinsel and Copper Cordage—Special Cables

SIGNAL ENGINEERING & MFG. CO.
Relays—Bells—Horns—Code Call Systems—Fire Alarm Systems

HART MANUFACTURING COMPANY
Remote Control Equipment — Switches — Relays—Thermostats

HAZARD-OKONITE COMPANY
Copperweld, Bronze, Copper, Telephone Wire Division

TRICO FUSE MFG. CO.
Fuses, Oilers, Clip Locks and Fuse Pullers

BURKE ELECTRIC COMPANY
Bakelite Controlead Terminal Blocks

THIS MONTH'S NEWS

PUD ASKS REHEARING IN PUGET POWER PURCHASE

Skagit County PUD has petitioned the Washington state supreme court for a rehearing of its recent decision declaring the proposed $135,000,000 Puget Power purchase illegal (EWest, July p. 104). The rehearing petition contended:

1. The majority opinion fails to take cognizance of the evidence which discloses that the transaction is the proposed acquisition of electric utility systems by the 15 public utility districts served by the Puget system . . . through the agency of the respondent district, all pursuant to the express authority granted the districts by statute to contract with each other for carrying out any of the powers authorized by the act.

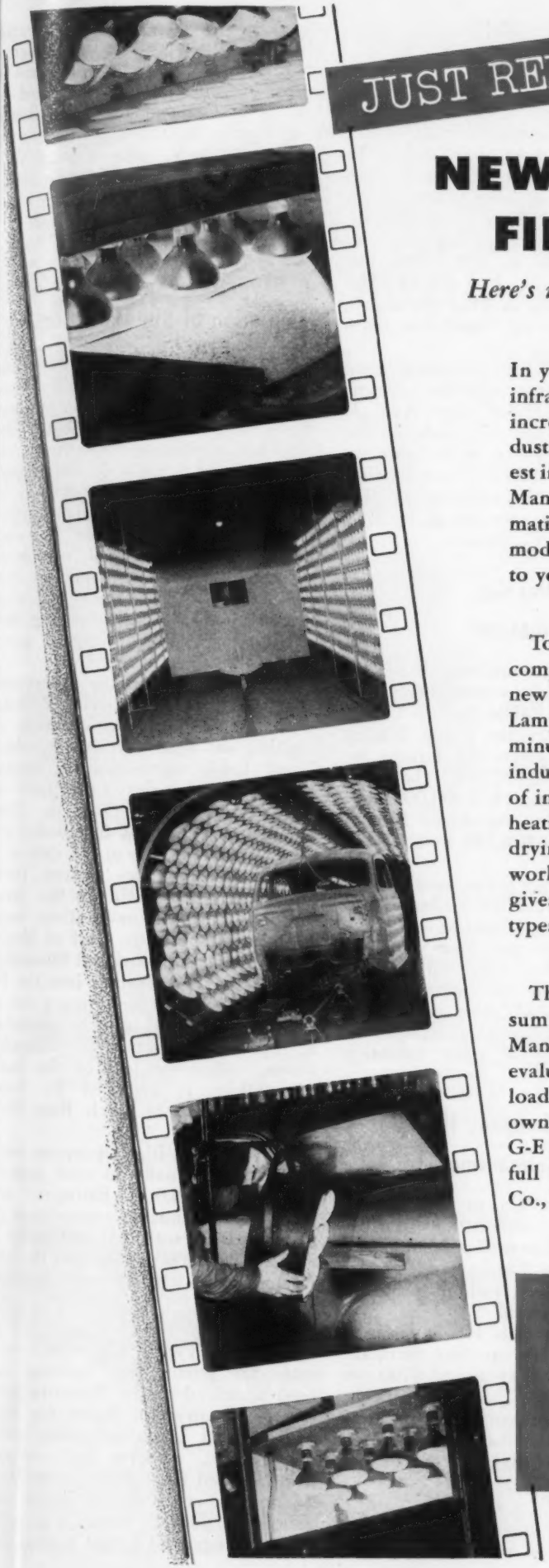
2. The majority opinion does violence to the plain meaning of the unambiguous language of a legislative act, by applying rules of statutory construction which have no place in this case and the use of which is not supported by the authorities cited by the majority opinion as the basis for the application of those rules to this case.

3. Since the reargument of this case on Jan. 30, 1947, the legislature enacted into law Chapter 242, laws of Washington, 1947, which validates the bond issue and all proceedings relating thereto, which are before this court in the instant case.

4. The **majority opinion** so narrowly construes the powers of districts under the act as to make even the piecemeal acquisition by each district of the portion of the Puget system which served the district impossible.

● CONDEMNATION proceedings against Pend Oreille (Wash.) County properties of Washington Water Power and Mountain States Power Co. will be started by Pend Oreille PUD, according to Norman Mackenzie of Spokane, secretary of eastern Washington PUDs. Suit against WWP will be in superior court at Newport, against Mountain States, in federal district court at Spokane.

● CONDEMNATION case of Stevens County PUD against Washington Water Power company properties in Stevens County, Wash., will not go to trial before April 1948, under terms of a stipulation agreed to by both sides in a superior court hearing



JUST RELEASED:

NEW G-E SOUND SLIDE FILM ON INFRARED

Here's more power for your power sales program!

In your job of selling "more power to America", infrared lamp ovens deserve active promotion as an increasing source of desirable industrial load. There's a lively interest in Infrared throughout industry. Many manufacturers want full information and are eager to try this modern heating method. They look to you for counsel.

See the New G-E Promotion Kit

To help you sell Infrared, General Electric offers a complete promotion kit, built around showings of the new full-color sound slide film entitled "Infrared Lamps for Better Production." This interesting 30-minute picture story makes it easy for you to acquaint industrial production people with the many advantages of infrared energy for baking, preheating, dehydrating, curing and drying. It explains how Infrared works, shows typical applications, gives a quick education on lamp types and oven arrangements.

New Manual Gives the Facts

The entire G-E Infrared promotion program is summed up in a new 40-page Power Salesman's Manual. It contains all the information you need to evaluate Infrared as an industrial load builder and to organize your own local promotion. Call your G-E Lamp representative today for full information. General Electric Co., Nela Park, Cleveland 12, Ohio.

G-E LAMPS

GENERAL ELECTRIC

TORK CLOCKS

TURN ANYTHING ELECTRIC "ON" AND "OFF" REGULARLY AND AUTOMATICALLY.

TORK CLOCKS

For all types of electrical switching and time control; standard 24-hour models available for 110 or 220 volts, 60c. A.C. Additional features such as Astronomic Dial, Weekly Calendar Wheel, additional 'ON' and 'OFF' operating arms, Selectors, Time Delay circuits, and other features are available to meet your requirements. Prices from $13.00 list and up. We will be pleased to recommend the Tork Clock best suited to your needs.

SHOW WINDOWS
SIGNS AND POSTERS
HEATING CONTROL
AIR CONDITIONING
POULTRY HOUSE LIGHTS
DEFROSTING
FREEZER UNIT ALARMS
STREET LIGHTING
APPLIANCE CONTROL

ASTRONOMIC DIAL "ON" and "OFF" operating arms are adjusted daily to sun time automatically. Follows changing seasons with uncanny accuracy, requiring no attention after being set when installed. Price—only $12.00 extra with any Standard 24-hr. Model Tork Switch. Write for complete bulletin on Astronomic Dials and other Tork Products.

TORK CLOCKS

'SAFETY SET' COMMERCIAL WALL CLOCK

No standing on chairs; electrosetting mechanism allows clock to be re-set easily from the floor. Reflectionless 14" dial; span aluminum case, white, maroon and polished aluminum. Self-starting, 110 volts, 60 cycle A.C.

TORK CLOCK CO.
MOUNT VERNON NEW YORK

SEATTLE CITY LIGHT REFUNDING BONDS

Bid of Halsey, Stuart & Co., Chicago, offering a premium of $9,450, was the best of four received July 14 by the City of Seattle for refunding a $7,000,000 bond issue at an interest rate one-half per cent lower than at present. Under the refunding program, the interest rate on the bonds will drop from 2½ to 2% a year. The $7,000,000 bonds, bearing the higher interest, were issued about five years ago.

Provisions of the refunding issue enable City Light to recall for payment the entire $7,000,000 after Aug. 1, 1952. Average life of bonds in the issue is 16¾ years, with maturity dates extending to 1970. The refunding will save the city approximately $597,000 in interest, according to City Comptroller W. C. Thomas.

Colorado Utilities Get Higher Tax Valuations

Colorado's state tax commission hit all types of utilities with higher valuation for 1947. Public Service Co. of Colorado, already the state's biggest taxpayer, was given the largest increase of all, $1,798,745. The firm, now engaged in a $63,000,000 refinancing program, was raised from a valuation of $38,028,295 to $39,827,040.

Other companies in the same general category got larger bills: electric and cable railroads, an increase of $223,725 in valuation; telephone and telegraph companies, $485,880 higher; all private power generating utilities were upped $2,317,490; and rural electric cooperatives were assessed on a basis of $195,135 more valuation than in 1946.

New Mexico Company Has Approval on Refinancing

Public Service Co. of New Mexico has been given authority by the Security and Exchange Commission and the New Mexico Public Service Commission to proceed with its proposed refinancing program.

The program calls for issuance of $6,800,000 of 30-year first mortgage bonds and 20,000 shares of $100 par cumulative stock. The funds will be used by the company in redeeming $6,648,220 of indebtedness and to aid in financing a $6,000,000 construction program.

● FPC has authorized California Electric Power Co. to issue 60,000 shares of $2.50 dividend cumulative preferred stock, $50 par value. Under agreement between the company and a group of underwriters represented by Shields & Co. and the First Boston Corp., price to the company is par value per share, plus accrued dividends from July 1, 1947, and offering price to the public is $52 per share plus accrued dividends from July.

Ceremony Marks Partial Completion of Big Thompson

The longest irrigation tunnel in the world—eventually to provide water for generation of 700 million kilowatts of electric power—was dedicated June 23 when Colorado's Governor Lee Knous turned a valve diverting headwaters of the Colorado River from the western slope through Adams tunnel to the state's eastern front. The ceremonies observed partial completion of the Colorado-Big Thompson river reclamation project which will water 615,000 acres of dry farming land and activate seven projected power plants.

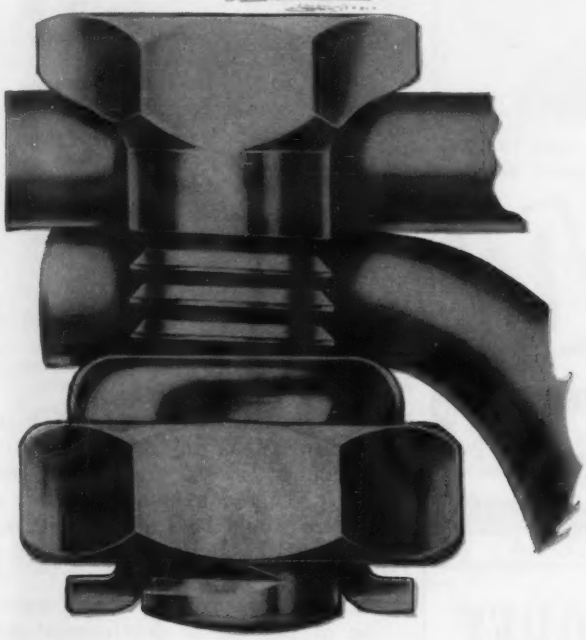
Waters released at the observances were, actually, from Grand Lake, where national celebrities were assembled as witnesses and speakers. Grand Lake, augmented by Shadow Mountain reservoir, constructed to impound additional Colorado River water, released a flood that boiled into the 13-mile-long bore at the rate of 75 sec. ft., reaching its eastern portal three hours later. Under the diversion program, Colorado River water will now flow into the Gulf of Mexico via the Platte, Missouri and Mississippi rivers, after first feeding into the Big Thompson channel for primary duty as an irrigation and power producing agency. Compensation to Colorado's western slope for loss of the water thus taken, is provided by Green Mountain Dam to catch Blue River flood waters.

The Colorado-Big Thompson enterprise was originally to cost approximately $28,000,000. Estimates now place the ultimate expenditure at $128,000,000, with $37,500 spent to date ($12,500,000 going into the Alva Adams tunnel which was dedicated June 23.)

● Montana Power Co. reductions in rates for public type lighting have been approved by the Montana public service commission. Rates for street lighting and lights in parks, public playgrounds, airports and runways were reduced from $5 kw. monthly to $4.25. The order covers lights operated from dusk to dawn. The reduction was requested by the utility.

Use Tough Kearnalloy BRONZE CON-NEC-TITES

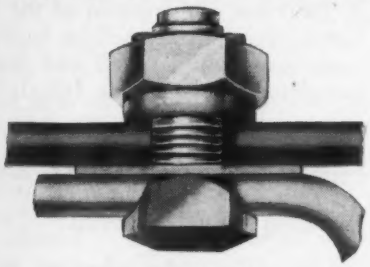
For Line Connections That Stay Tight— Without Nicking Line Wires



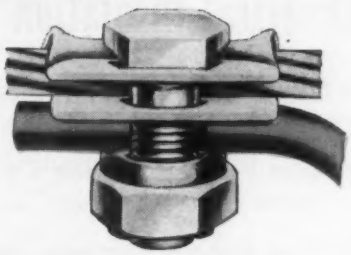
Con-Nec-Tites of the new Kearnalloy bronze are tough and mechanically strong enough to withstand high torque. Yet they are resilient enough to cushion against line wires and prevent nicking.

All Kearney Con-Nec-Tites have clean, uniform threads, thread lead pilots, V-groove surfaces in head and washer and correct slot width. Use tough, nick-free Kearnalloy Con-Nec-Tites for all types of connections.

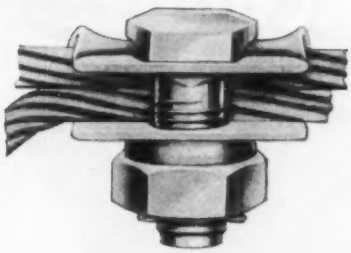
Eliminate Electrolytic Action—Use Plated Con-Nec-Tites



Copper to Aluminum



Aluminum to Copper



Aluminum to Aluminum

The cadmium plated Kearnalloy Con-Nec-Tites shown here prevent electrolytic action because the copper and aluminum wires never come in contact with one another. Use them to assure good conductivity and tight connections.

For Better Results

Specify Kearney Products

MAYDWELL & HARTZELL
INCORPORATED
LOS ANGELES • SAN FRANCISCO • PORTLAND

for ENDURING SERVICE

under all sorts of operating conditions

Specify VICTOR

NEMA 34.5-KV Switch Insulator

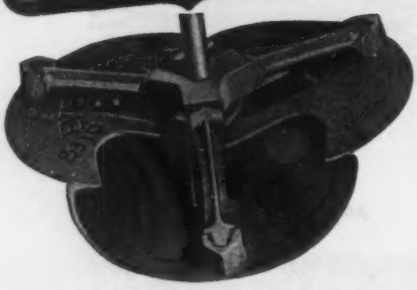
At Victor, every step in the making of porcelain is carefully controlled. From design to final inspection, safety and long-life is built into each high voltage insulator. For satisfaction always look to Victor.

V

VICTOR INSULATORS, Inc.
VICTOR, NEW YORK

BIRTHPLACE OF FIRST WET PROCESS HIGH VOLTAGE INSULATORS

EVERSTICK ANCHORS...



FOR *SPEED* IN INSTALLATION

The exclusive Everstick nut housing locks the Anchor firmly on the rod. This speeds up installation. Plates are so designed, that they expand easily into undisturbed earth, and extra holding power is achieved. Made of tough, rust-resistant malleable iron. Write for bulletin.

EVERSTICK ANCHOR CO.
FAIRFIELD, IOWA

C. D. LaMOREE
Electrical Insulation

The Spaulding Fibre Company, Inc.
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Irvington Varnish & Insulator Co.
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PG AND E GIVEN LICENSE FOR TWO HYDRO PROJECTS

FPC has granted a 35-year license to Pacific Gas and Electric Co. for construction and operation of Rock Creek and Cresta hydroelectric projects on the North Fork of the Feather River in California.

The Rock Creek project would include a concrete diversion dam across the North Fork, a power house with two 73,500-hp. turbines each connected to a 63,000-kva. generator, a substation, a switchyard, two transmission lines about 500 ft. long. The dam would be about 115 ft. high and 550 ft. long. Maximum elevation of the dam would be 2,212 ft. with normal operating water surface level at elevation 2,205 ft. The reservoir formed by the dam would extend upstream about two miles to near the junction of Yellow Creek with the North Fork.

Plans for Cresta project include a diversion dam on the North Fork below the Rock Creek Dam, a power house equipped with two 46,500-hp. turbines each connected with a 37,500-kva. generator, substation, switchyard and transmission lines. The dam would be about 113 ft. high and about 360 ft. long Maximum elevation of the dam would be 1,680 ft. with normal operating water surface level at elevation 1,670 ft.

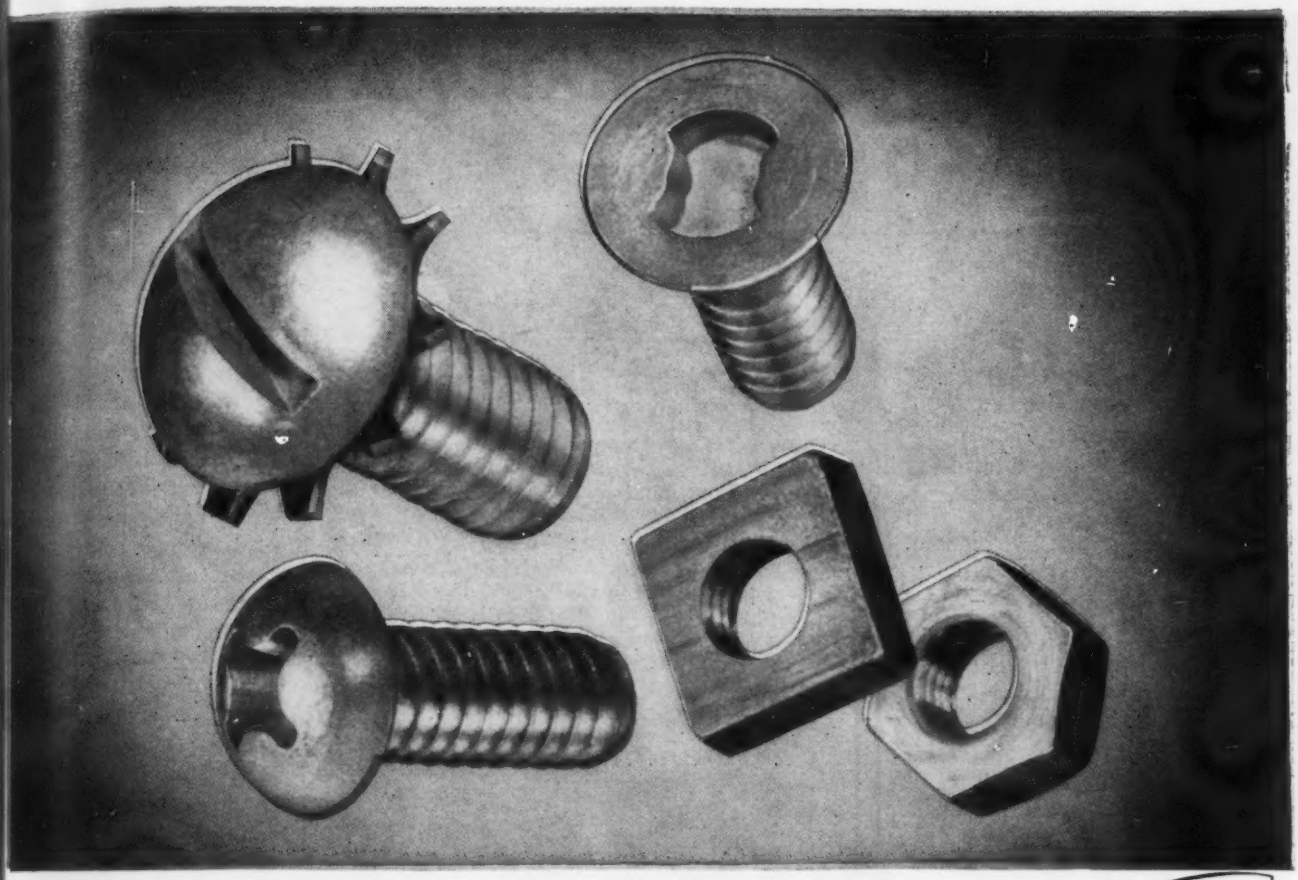
The order provides that construction of the Cresta development shall be commenced by Dec. 31, 1947 and shall be completed not later than July 1, 1950 and construction of the Rock Creek development shall be begun not later than July 1, 1948 and shall be completed not later than July 1, 1951.

Federal Loans Granted for Planning Power Systems

Federal loans for planning of new power facilities were granted last week to the Village of Bonner's Ferry, Idaho, and the Tillamook PUD, Ore.

Bonner's Ferry obtained a $19,500 loan from the Federal Works Agency to finance drawings and specifications for improvement of its hydroelectric generating facilities. Bonner's Ferry Light & Water Department which owns two small hydros and a diesel generating plant, proposes to raise the height of its power dam, installing a new penstock, and to complete other additions at a total estimated cost of $257,000.

The Tillamook PUD will extend its distribution system, installing new substations and other equipment, at a cost of $430,000. It received a $20,000 FWA loan for planning this program.



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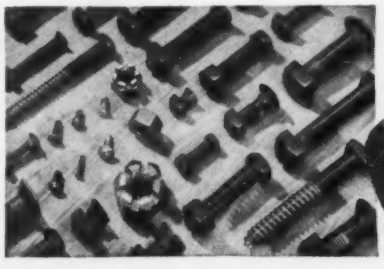

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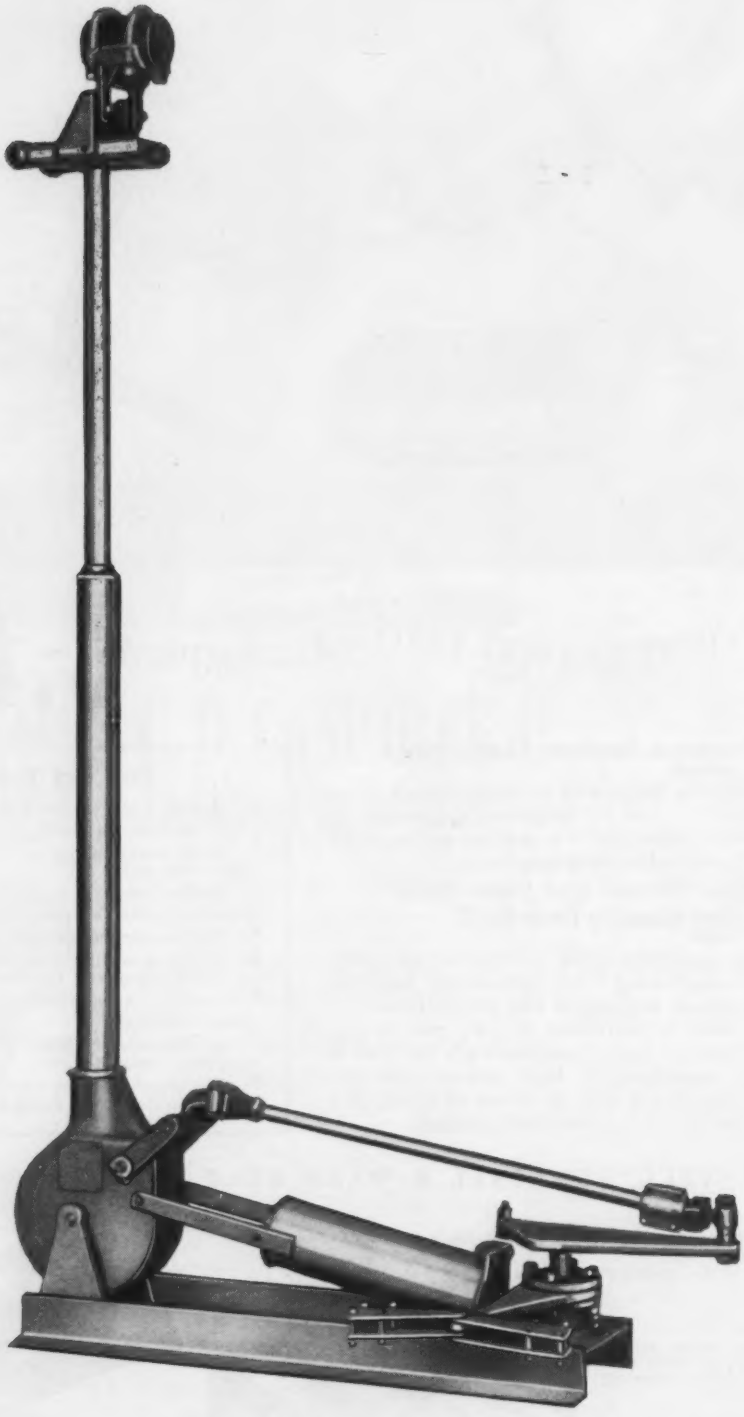

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YOUR CHANCES OF GETTING AHEAD

FOR 20 years we have been whittling away the foundations of our economic structure. We have been cutting away the incentives to "get ahead in the world," to increase production and to improve efficiency. Unless this process is reversed soon, we risk the sort of industrial stagnation that currently afflicts Great Britain so disastrously.

How far the whittling has gone is shown by the statement in the center of the page. It shows that everyone's stake in working harder and getting ahead has been reduced sharply since 1929. In that year, anyone who was even moderately successful could look forward to reaping the rewards of his success. If he earned $5,300 annually over a period of 25 years he could retire on a comfortable income of $3,000 per year. Or he could pile up enough capital to go into business for himself. He could fulfill the American dream as phrased by Abraham Lincoln in his first annual message to Congress in 1861:

"The prudent, penniless beginner in the world, labors for wages awhile, saves a surplus with which to buy tools or land for himself, then labors on his own account another while, and at length hires another new beginner to help him. This is the just and generous and prosperous system, which opens the way to all, gives hope to all, and consequent energy and progress, and improvement of condition to all."

Look at the situation today. To retire on an annual income from investment that will buy as much as $3,000 did in 1929, a young man needs to earn over $13,000 a year for 25 years. That's more than 2½ times the income he would have needed in 1929. The same thing is true of acquiring a stake in a business.

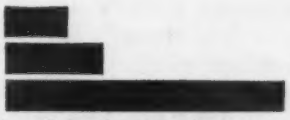
YOUR CHANCES OF GETTING AHEAD

To see how your chances of getting on in the world have changed during the past few decades, the McGraw-Hill Department of Economics has calculated how much it now takes to save enough to acquire a retirement income or a comparable stake in a business, as compared to what it took in 1914 and 1929.

The objective set is an income from investment equal to $3,000 a year in 1929 dollars. It is assumed that the savings required to yield this income are made over a period of twenty-five years. During that period it is also assumed that $4,000 per year (in 1929 dollars) is spent on living expenses.*

Here is how the figures work out:

	Yearly Income Needed
1914	$3,075
1929	5,267
1947	13,221



It now takes more than four times as large an annual income as it did in 1914 to gain a comparable stake. It takes well over twice as much as it did in 1929.

Changes in three factors — federal income taxes, living costs, and interest rates — explain why the income needed has multiplied so. Here's how these factors line up for the three years.

	Federal Income Taxes Married Men, 2 dependents		Cost of Living (Index Numbers 1935-39)	Interest Rate High-grade Corporate Bonds
	$5,000 income	$10,000 income		
1914	$10	$60	71.8	5%
1929	$3	$40	122.5	5%
1947	$589	$1,862	155.0	2½%

Similar calculations show that if we could reduce federal expenditures from $35 billion to $25 billion annually, raise interest rates by one-tenth and lower living costs by 15% — all realistic possibilities if we make the effort — then the income needed to build up such a retirement fund would come down to $9,500. The chances of realizing that goal would then be restored to what they were in 1929.

*Several other factors were omitted from the calculations because they would not have a decisive effect on the results. Thus, existence of social security pensions and retirement funds now reduces the income needed; but if state income taxes were added, the income needed would increase.

Why Try to Succeed?

While the income needed for retirement today has increased 2½ times — or by more than 150% — since 1929, the average person's income has increased only 80%. So the average man's chances of achieving success are really slimmer now than a generation ago.

This 1929-47 trend is something new in America. The average person's chances of getting ahead improved during 1914-29. In that period the dollar income needed for retirement or a stake in business rose by 75%, but the average income rose by 100%. So more people were within striking distance of success and security in 1929 than in 1914. The story has been different since 1929.

Fewer people actually do achieve financial success today. Only 1% of all families now have incomes large enough to build up a retirement fund or a stake in business. In 1929 almost 6% of all families attained a comparable degree of success.

Higher taxes are the most important reason why it takes so much more now to build up a competence. They account for one-half the increase in the amount needed. The other half is explained by higher living costs and lower interest rates.

It is, of course, true that few people ever get into the higher income brackets. So the process of cutting

away the incentives which play such a key role in our economic system affects comparatively few people immediately. It does, however, have a powerful indirect effect on all of us.

Everybody Loses

When half to four-fifths of any additional income of successful people goes to Uncle Sam a heavy drag is obviously put on doing the work to get it. Thus, we stand to lose the benefit of full use of the nation's best brains. By so doing we stifle industrial progress. And the loss in productive efficiency far outweighs the tax revenue the Treasury gains. Carried far enough, the process of stifling economic progress by slashing rewards leads straight to industrial stagnation.

The same process also multiplies the risks of embarking on new capital investment. High taxes rule out all but the most profitable new projects and restrict most expansions to boom times when profits are high. So capital investment follows a boom and bust pattern and, by so doing, contributes much to ups and downs in production and employment.

The Sorry Plight of Britain

The case of Britain today provides an object lesson of how blighted incentives produce industrial stagnation. *Britain's number one economic problem is to get more production. But the tax load there is so heavy it stifles the incentive to produce more.*

A coal miner who works an extra shift pays about a third of his added earnings to the tax collector. And, as the London *Economist* comments, tax rates on business executives are so high that they kill every incentive except that to tax evasion. In short, not only is the incentive to succeed blighted, but so is the incentive to work.

A root-cause of Britain's trouble is this: The cost of an expensive program of social benefits has been piled on top of the heavy costs of paying for past wars and trying to prevent future wars. Tax rates are boosted accordingly. What her experience proves is that the attempt to provide excessive social benefits may defeat itself. It raises the tax burden on rich and poor alike and smothers the incentive to work. So the underlying basis of all economic benefits—production—is eaten away.

We in the U. S. haven't traveled as far down the stagnation road as Britain has. Taxes amount to about 26% of national income here as against about 45% there. But, unless we start soon to build up incentives to do better work, instead of whittling them away as we have been doing, we will catch up with Britain fast.

It's Late but Not Too Late

Can anything be done? Decidedly yes, *particularly by tax reform and reduction in the cost of living.* As far as interest rates are concerned, any large increase would raise excessively the cost of carrying our war-swollen national debt, and hence raise taxes. But some increase in what are now excessively low interest rates may well be both feasible and desirable.

Action on the tax front is the first order of business. Our jerry-built tax structure is the thing that is chiefly responsible for cutting the incentives to work harder. Two things are important: 1) Government spending must be pared to the bone; 2) The tax system must be completely overhauled to remove the shackles on all-out production.

The 56th editorial in this series, published in March, outlined major steps that need to be taken in remodeling federal taxes in order to increase incentives to individual and business enterprise. *The revenue bill now before Congress is no more than a short step in the right direction. Much more must be done to clear the way for high production and rising living standards.*

Lifting the blight which taxes now place on incentives would help cut the high cost of living. It would stimulate greater production and greater efficiency. But a further step is necessary. Part of the benefits of improved efficiency must be passed on to consumers in the form of lower prices.

In the past few years we have been following precisely the opposite course. In many cases wages have been increased all out of proportion to increased productivity. Result—soaring prices and a severe squeeze of the consumer, to which some greedy exploitation of war-created shortages has also contributed.

To Give Ability a Chance

Our basic and most crucial problem is to get back on the track which leads to higher production and improved living standards all along the line. We got off that track in the 30's. Then, we started scrambling for larger slices of the same pie instead of trying to produce a larger pie. Now the process of getting back on the track is greatly complicated by the tremendous tax burden growing out of the war.

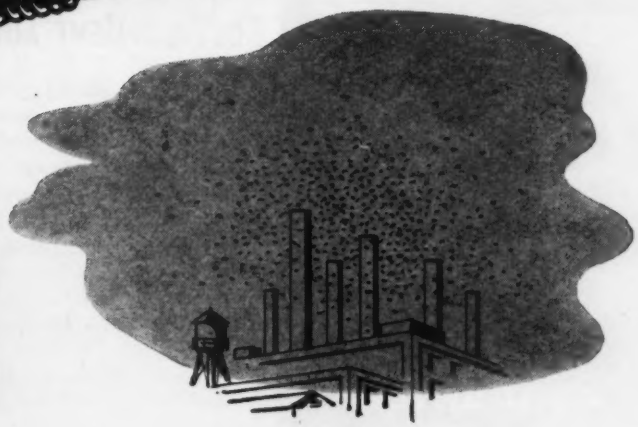
Yet it's not too late to turn back from the road that leads to industrial stagnation. As the statement in the center of the page shows, we could restore the odds of getting ahead to what they were in 1929. Cutting the federal budget to $25 billion a year and putting the tax structure in good order are the crucial first steps.

By taking these steps soon, Congress can go far to restore the incentives to hard work and efficiency which have been so largely washed away in the past 20 years. If they are not taken the American dream of getting ahead by hard and effective work will exist only in the history books, and our children will inherit from us an economic order without opportunity, without hope, without individual liberty.

James H. McGraw, Jr.

President McGraw-Hill Publishing Company, Inc.

THIS IS THE 59TH OF A SERIES



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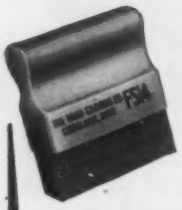

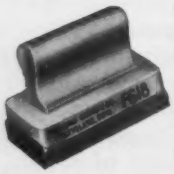

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OWENS RIVER GORGE POWER DEVELOPMENT AUTHORIZED

The Los Angeles Board of Water and Power Commissioners has authorized immediate development of the hydroelectric power resources along the Owens River Gorge at a total cost of $40,500,000.

Three power plants will be built, one below the other, each containing a single 37,500 kw. turbo-generator to utilize a 2,375 ft. drop from Crowley Lake to the end of the gorge near Bircham's Canyon. A 250-mile transmission line will be constructed from the gorge to a receiving station in San Fernando Valley.

Of the total estimated cost, $4,250,000 already has been spent on Long Valley Dam, intake structures and 6,576 ft. of tunnel. Long Valley Dam will be raised by 20 ft. in the program, increasing the water storage capacity of Crowley Lake from 183,000 to 315,000 acre-ft. Approximately 58,000 ft. of concrete-lined tunnel, including the 6,576 ft. already completed, will be built to deliver water from Crowley Lake to the three power plants.

Fabrication of penstocks which will carry the water to the hydraulic turbines will require 18,534 ft. of 8-ft. diameter steel pipe. Small diversion dams will be built below each power plant for water regulation.

Electrical energy from the proposed development could be delivered to Los Angeles at a lower cost than power generated by steam plants when fuel oil cost is as low as $1.35 per barrel. Charles P. Garman, chief electrical engineer, reported.

● KLICKITAT County PUD of White Salmon, Wash., will call bids early in the fall for labor involved in building of 350 miles of distribution line in the Goldendale area, according to Emmet E. Clouse, manager. The actual invitation awaits the arrival of some of the material needed for the job, and the completion of surveys now under way by Howard Zenier & Associates of Portland, Ore. All orders for material have been placed. Cost of the work, to be financed by an REA loan, is estimated at $600,000.

● POURING of concrete foundations for Pacific Gas and Electric Co.'s 220,000-volt transmission line down the west side of California's central valley was started last month. The line will run south from Telsa substation down the San Joaquin Valley to the company's Midway steam plant near Bakersfield. It will cost $6,500,000 and is scheduled for completion in June 1948.

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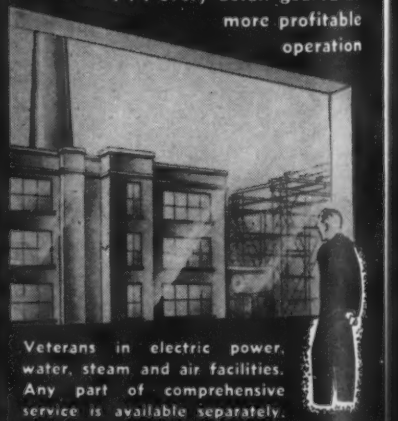

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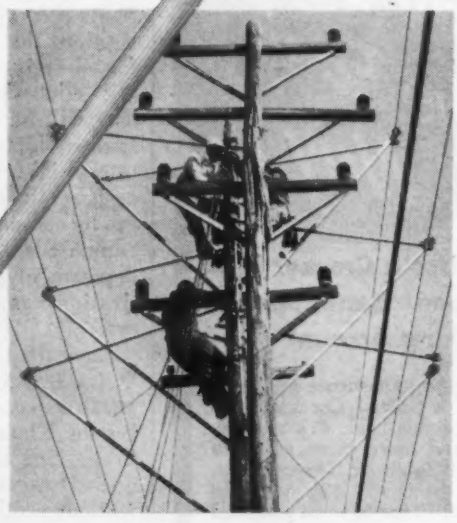

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The new actuating screw makes the tool faster and easier to use, only six turns from fully open to fully closed — less than half the number required on the former design.

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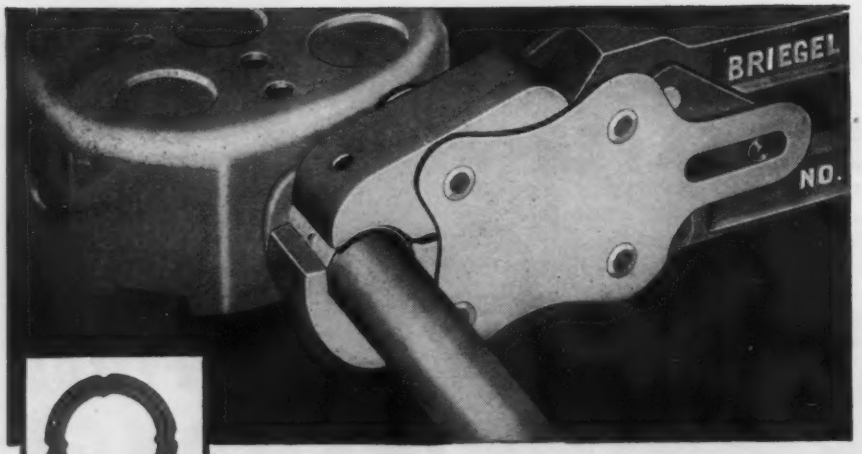

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WESTERN POWER COMPANIES WIN ADVERTISING AWARDS

Hawaiian Electric Co. won three national awards and other Western power companies took firsts and honorable mention in the 1947 Better Copy Contest of the Public Utilities Advertising Assn. Hawaiian Electric won in group A for a series of newspaper advertisements, 22 competing; public relations newspaper ads, 61 competing; employee publications, 23 competing.

Pacific Gas and Electric Co. took a national award in group C on its annual stockholders' report, 14 competing, and honorable mention in the motion picture classification. Southern California Editon won in group C against 29 competitors for special booklets.

Colorado Central Power Co. was given a national award in group A, stockholders' annual report, 14 entries. Washington Water Power took national honors in outdoor advertising. Group A, 18 entries; honorable mention for stockholders report and employee publication. Puget Sound Power & Light, competing in Group C, won honorable mention in the following classifications: inside display; stockholders report; radio.

Northwestern Electric Co. received honorable mention in group B for a series of newspaper ads and Central Arizona Light & Power honorable mention same classification, group A.

• AFTER a five-year wartime interruption, the George A. Hughes award for electric utilities making outstanding educational gains in appliance uses will be conferred for 1947, under sponsorship of Edison Electric Institute. Eight prizes totaling $2,000 in cash, a silver trophy and eight plaques go to companies for local advertising campaigns, school home economics department programs and market cultivations among architects and builders.

• CALIFORNIA PUBLIC UTILITIES COMMISSION has authorized a rate increase for the Klamath Water, Light & Power Co., giving the utility 50% more revenue. However, rising operating costs will cut profits to 1% of invested capital. The new rates, granted on an interim basis, are effective until Oct. 1, 1948.

• AT A MEETING of the New Mexico REA early in July, it was estimated that $3,360,000 would be needed to carry out the agency's 1948 program. Of this amount $1,600,000 is for nine existing co-ops. The balance is for five newly organized co-ops.

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Mercoid mercury switches are known the world over for their dependable service. They are not affected by dust, dirt or corrosion; nor are they subject to open arcing with its attendant consequences of pitting, sticking or oxidized contact surfaces, all of which, are likely to interfere with normal switch operation.

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MERCOID CONTROLS are available in a variety of types for sensitive control of Pressure, Temperature and Lever actuation.

MERCOID
APPROVED CONTROLS

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NOTES ON THE TRADE

● GEORGE R. MAGNES has announced that the Agencies Co. has been appointed Pacific Coast representative for the Narragansett Wire Co. of Pawtucket, R. I. This plant is the former Anaconda operation at Pawtucket, Magnes states, and is headed by some former executives of the Anaconda Wire & Cable Co. Agencies Co. is maintaining a warehouse and sales office at 125 S. Santa Fe Ave., Los Angeles, and a sales office at 420 Market St., San Francisco. The company also represents O. Z. Electrical Mfg. Co., Auth Electric, Wheeler Ballasts (division of Sperry Products), Appleton Rubber Co., and Rhode Island Insulated Wire Co. (AF type wire).

● R. W. "WALLY" TULL has established his own selling organization, functioning as a manufacturer's representative with headquarters in the Western Merchandise Mart, 1355 Market St., San Francisco. His operations will cover the eleven Western states with representatives in Seattle, Salt Lake City and Los Angeles. Tull for several years was San Francisco manager of the Nelson R. Thomas Agency of Los Angeles and will continue to represent Nelson R. Thomas in the San Francisco area.

● WILSON & Co., 1335 Market St., San Francisco, has been appointed representative in the eleven Western states for the Wastemaster garbage disposal unit manufactured by the Lockley Machine Co. of New Castle, Penn. J. C. Wilson formerly was district manager for Bendix radio and recently opened his own office in the Western Marchandise Mart.

● REMLER Co., San Francisco radio manufacturer, has named Jack Totten as vice-president in charge of sales. Totten was formerly northern California branch manager for Gilfillan Bros. He established Gilfillan in Wash., and organized the firm of Herb Zobist Co., Seattle and Spokane. Formerly serving the Western states only, Remler now plans to have distributors throughout the country to handle a complete new Remler line, according to R. C. Gray, president.

● LEEDER'S Pacific Ltd. has been organized under the presidency of C. H. Leeder, and will engage in the production of electrical appliances including refrigerators, heaters, irons and toasters. Approximately seven acres of plant buildings have been erected on the Pitt River Road in Coquilam near New Westminster, B. C. Leeder states that approximately 1,000 workers will be employed.

● ANNOUNCEMENT that Walter T. Dailard has been appointed retail salesman for Perfecold Refrigeration Co. of Los Angeles, was made by L. M. Peterson, manager. Dailard was former sales representative for the National Cash Register Co.

● THOMPSON ELECTRIC Co., Cleveland, Ohio, has appointed Bert T. Heinz as manufacturer's representative in Oregon, Washington, Idaho, and Montana, with offices at pier 59, Seattle, Wash.

● LOS ANGELES district office of Maydwell & Hartzell Inc. has been moved to 427 West Fifth St. Warehouse activities will remain at their former address, 455 Colyton St., Los Angeles.

● FARIES MFG. Co. has announced the appointment of Floyd Yudelson as representative in California, New Mexico and Arizona, with headquarters at 818 N. Fairfax in Los Angeles.

New Westinghouse Supply Co. headquarters in Yakima, Wash. J. R. Wells, former Tacoma manager for the supply company, will head the new branch, which is located at 13 S. Seventh Ave. It will serve six counties

ACCIDENTS DON'T HAPPEN! *They're caused—and costly*

Color Engineering high-spots danger—eases work fatigue—helps keep production on schedule

Unmarked danger zones cause accidents. Look out! Monotonous surroundings cause carelessness. Look out! Bad light causes eye-strain, fatigue. Look out!

Strain, carelessness, accidents—they cost you money. Look out!

Look out *first!* Practice prevention. Relieve strain with color—destroy monotony with color—isolate danger with caution colors.

Color Engineering by Fuller does it—scientifically.

Call in Fuller. Let one of our trained representatives survey your plant—machines, controls, switches, ceilings, walls, floors and your plant traffic flow. You'll get a *written report* with detailed specifications and actual color chips for every recommended finish. You'll get further consultation as needed until the job is done—by a painter we may recommend or by your own painter. All without obligation.

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Just connect wires, screw to outlet box and your chain suspension fixture is hung—in a few minutes. All it takes is a screwdriver!

Complete with receptacle, two 5-foot chains, "S" hooks and cord clips. Fits standard 4" or 3¼" outlet box or plaster ring. Self-grounding—regular 2-wire cord and plug may be used. $1.65 each list

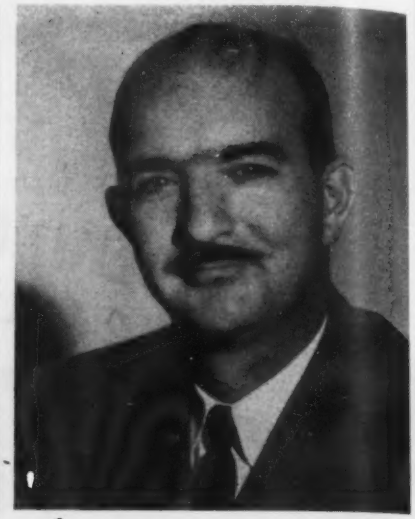
Day-Brite Lighting, Inc., 5412 Bulwer Ave., St. Louis 7, Mo. Nationally distributed through leading electrical supply houses.

In Canada: address all inquiries to Amalgamated Electric Corp., Ltd., Toronto 6, Ontario.

*Patent No. D-141024, others pending. Underwriters approved.

321

IT'S EASY TO SEE WHEN IT'S DAY-BRITE Lighting



Allen

● CLYDE E. ALLEN and ROBERT E. OLSEN have established the firm of Allen & Olsen Mfg. Co. to make fluorescent lighting fixtures. With office and plant at 13452 W. Washington Blvd., Venice, Calif., the firm will distribute exclusively through recognized wholesale channels. Allen is well known in the electric appliance industry, has engaged in manufacturing and wholesale distribution in San Francisco and for the past two years has been general sales manager for Mitchell in Los Angeles. Olsen has been in the manufacturing business in the Los Angeles area for 30 years and formerly was with Mitchell as factory manager.

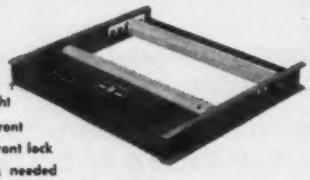
Olsen

● EARL H. BARKER was appointed Silex Pacific Coast manager covering eleven Western states. His headquarters office will remain in Los Angeles, Calif., where he has been located as coast sales manager.

TO REEL OR UNREEL THE EASIEST WAY

WHATEVER YOU USE ON A REEL . . . WIRE, CABLE OR ROPE . SAVE TIME AND LABOR WITH

ROLL-A-REEL



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Positive front lock
No jacks needed
Adjustable slots for many widths

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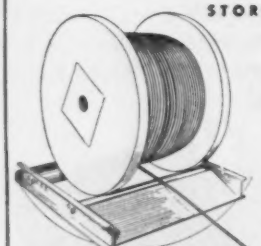

Style A:
2,000 lbs. cap.
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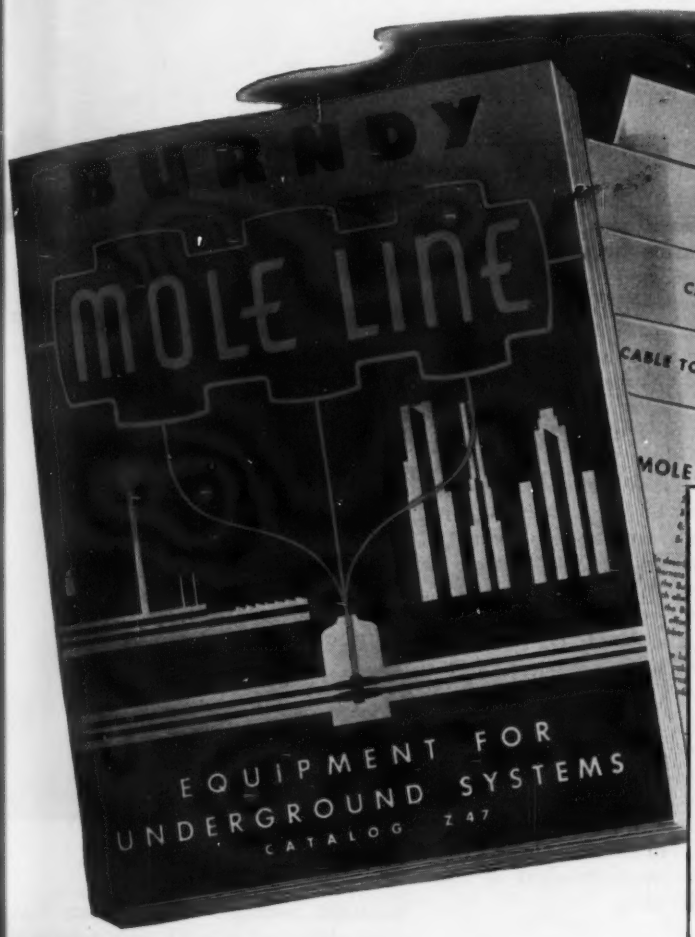

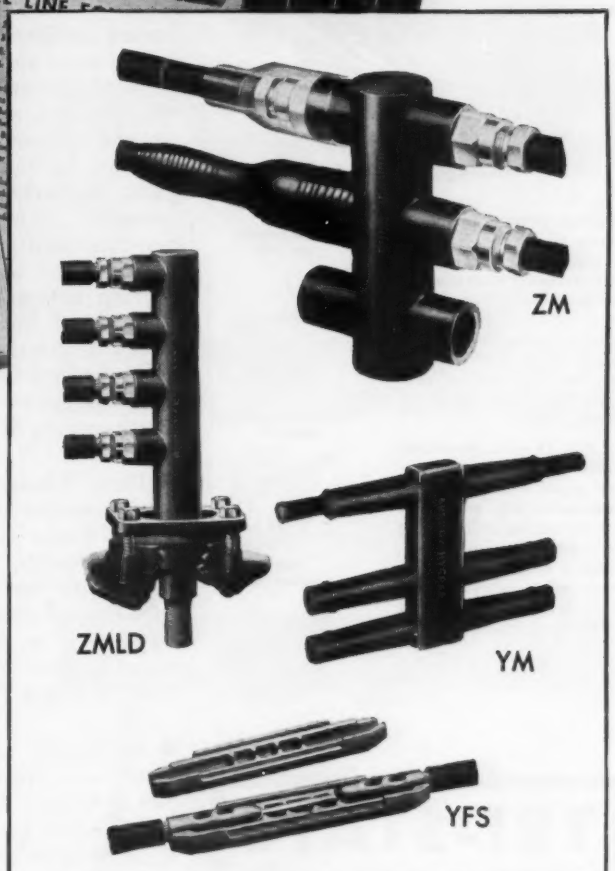

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GOOD PUSH-BACK QUALITY

SMOOTH INSIDE BORE

UNIFORMITY OF PRODUCT

NEWS ABOUT PEOPLE

● REORGANIZATION changes in personnel as a result of the merger of Pacific Power & Light and Northwestern Electric companies include the appointment of E. F. PEARSON as assistant general manager of the Northwestern division of Pacific Power & Light, in charge of the company's operations in Portland and Rainier, Ore. and Vancouver and Camas, Wash.. Other new assignments, announced by George T. Bragg, vice-president and general manager of the enlarged Pacific organization, include: CECIL A. ROOT, member of Northwestern's Vancouver staff since 1934, promoted to Vancouver district manager; J. C. PLANKINTON, head of Northwestern's commercial department, named assistant to the vice-president in the rates and research department; D. B. LEONARD, acting assistant general manager, appointed sales manager for the merged operation, with headquarters in Portland; H. H. SCHOOLFIELD, formerly Pacific's general superintendent, named chief engineer of the combined companies; O. L. LEFEVER, head of Northwestern's engineering section, made assistant chief engineer of Pacific. D. R. MCCLUNG, assistant superintendent, becomes Pacific's general superintendent and TOM PERRY becomes superintendent of the Northwestern division.

Tracy

Hagar

● BERT THOMPSON, assistant to the sales manager of the central division of the Puget Sound Power & Light Co. at Seattle, has retired after 52 years with the company. He started with the old Seattle Electric Co., later transferred to the Puget Sound Traction Co.. then joined the sales department of Puget Power.

● EFFECTIVE July 1, GROVER S. TRACY was appointed manager of the San Francisco division of Pacific Gas and Electric Co., succeeding Norman R. Sutherland, who has been promoted to vice-president in charge of public relations and sales. Tracy, who for the past two years has served as assistant manager of the San Francisco division, is a 41-year veteran of PG and E.

● GEORGE H. HAGAR recently was appointed engineer of electric operation of Pacific Gas and Electric Co. He succeeds D. D. Smalley, now vice-president in charge of PG and E operations. Hagar has been with the company and its predecessor companies for 35 years. HOMER G. KEESLING, electric superintendent of PG and E's East Bay division, was appointed central area superintendent, replacing Hagar. MELVILLE N. CLARK, electric service superintendent of the East Bay division, succeeds Keesling, and WALTER B. ALLATT will take over Clark's duties.

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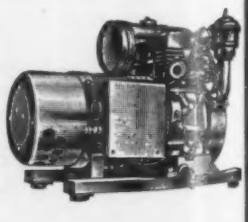

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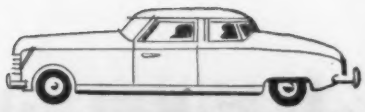
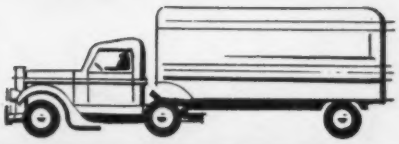
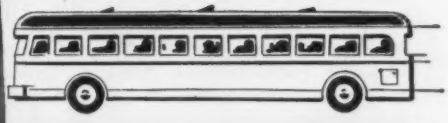


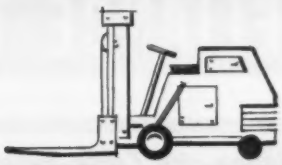
Automobiles



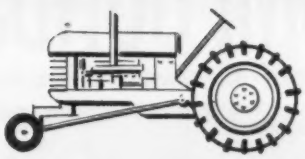
Trucks and Trailers



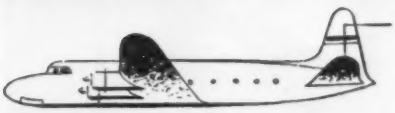
Busses and Trackless Trolleys



Industrial Electric Trucks



Tractors



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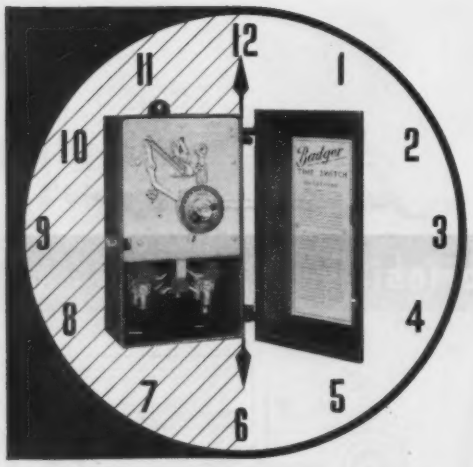

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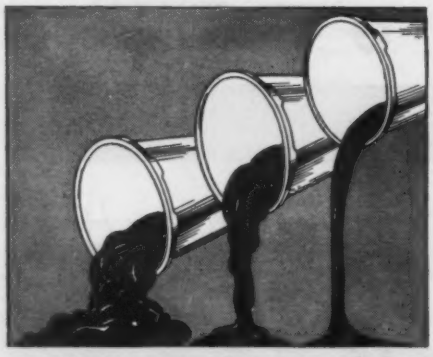

Minerallac gives you a complete assortment for every need: dense, viscous and fluid consistencies for high and low voltages in cable-joints, pot-heads, terminal bills, distribution cables, street lighting, telephone work. . . . Insoluble in oil or water, for all temperatures. Clean, safe, economical—outranks all others in quality.

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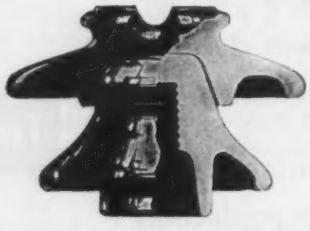

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Robinson

● JOSEPH A. ROBINSON has joined the ELECTRICAL WEST staff as assistant editor to WALTER C. HESTON, who took over the duties of engineering editor following the resignation of WAYNE SNOWDEN. Robinson is a native Californian, received his electrical engineering degree from U. C. in 1942. He then went to work for General Electric, spending several months in the San Francisco office before being transferred to eastern factories. Returning to San Francisco in the fall of 1943, he was in the G-E engineering and the apparatus departments until he came to ELECTRICAL WEST last month.

● R. D. MOODY has been appointed manager of the Allis-Chalmers San Francisco district office, according to an announcement by J. L. Singleton, vice-president and director of sales for the Allis-Chalmers general machinery division. Formerly assistant manager, he succeeds F. HARVEY SEARIGHT, who is named saw mill specialist for the Pacific region. Moody was graduated from the Colorado School of Mines in 1936. He worked for the Mineral Engineering Co. and the Riverside Cement Co. as a mining engineer before joining the company in 1938. Before entering the service Moody was in the Chattanooga office.

● JAMES C. MADSEN has been elected president of the National Association of Power Engineers, Utah No. 1, succeeding Wiley L. Ludwig. D. W. Thompson was chosen vice-president; Richard F. Taylor, corresponding secretary; Clifford Smith, recording secretary, Joseph S. Durant, treasurer and J. P. Quigley, financial secretary.

● FRANK A. STORTZ JR., former G-E heating appliance sales representative in San Francisco, has been appointed sales manager of the company's fan division.

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Necessary leads, lugs, screws, and nuts are included in each box for any type connectors.

Mallory MSG Capacitor:—Small, compact AC Motor Starting Capacitor that fits almost every mounting bracket or box. Replaces rectangular capacitors with leads, lugs or studs. Each capacitor is packed with complete set of universal mounting hardware and installation instructions.

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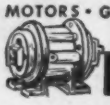
NEW AND REBUILT
MOTORS • GENERATORS • TRANSFORMERS

BOUGHT and SOLD
ELECTRIC EQUIPMENT CO.
ROCHESTER 1, NEW YORK

NUMERICAL Topflight Tape
FOR WIRE IDENTIFICATION
TOPFLIGHT TAPE CO. YORK, PA.

● EFFECTIVE June 1, F. M. FALGE was promoted to the position of assistant manager of Pacific sales district, of General Electric Lamp Department. He joined G-E as a lighting sales manager for the lamp department at Nela Park in 1926. Falge has specialized in various phases of lighting, contributing articles and booklets to the field. He was active in the U. S. Naval Reserve for four years, completing his naval service with the rank of commander. He returned to Nela Park in 1945, and until the present has devoted much of his efforts to the Sealed Beam lamp program.

● PUGET SOUND POWER & LIGHT Co., Seattle, has appointed Howard G. Carter as superintendent of light and power for its western division at Bremerton to replace the late A. M. McDonald. With a background education in engineering at the Texas College of Mines, Carter joined Puget Power at Bremerton eleven years ago as a clerk in the operating department and worked up to assistant superintendent in 1946.

● COAST COUNTIES Gas & Electric Co. has divided its territory into two regions, appointing A. E. STRONG regional manager of the Contra Costa area, with headquarters at Santa Cruz and Concord, respectively, President H. L. Farrar announced. District managers are C. R. HAYDEN, W. A. McCANDLESS, G. H. LOOSMORE, J. G. FOSTER, G. H. CONNER and E. C. STANLEY.

● CARROLL V. ROSEBERRY, sales engineer for Westinghouse in the San Francisco Bay area since 1936, last month was appointed assistant Pacific Coast district manager for the central station division. He will assist W. P. L'Hommedieu, district central station and transportation division manager. His headquarters will continue in San Francisco.

● ROBERT J. MARTIN, formerly Silex salesman in the Los Angeles area, has been promoted to district manager of the Los Angeles territory which includes southern California, Arizona and southern Nevada.

● D. B. KARLSKIND has been made Pacific Coast sales manager of the United States Rubber Co.'s wire and cable department, with headquarters in San Francisco.

● PRESTON M. POSTLEWAITE has been appointed Portland manager for the electrical and automotive divisions of the Wagner Electric Corp. He had been with the sales department at Pittsburgh

UNION PACIFIC

TREASURE MAP OF INDUSTRY

Washington *

TREMENDOUS WATER POWER
LOW ELECTRIC RATES
LEADER IN LUMBER
BASIC METALS AND ORES
LARGE AGRICULTURAL YIELD
SOURCE OF SEA FOOD
GATEWAY TO THE ORIENT
EXCELLENT TRANSPORTATION
FAST GROWING POPULATION
SCENIC WONDERLAND

* *One of a series of advertisements based on industrial opportunities in the states served by the Union Pacific Railroad.*

WATER POWER is one of Washington's most important industrial advantages. Two of the world's greatest dams, Grand Coulee and Bonneville, make it possible to offer industry unusually low electric power rates.

Lumber, coal, iron, nickel, chrome, aluminum —and other basic metals—are available "on the ground floor" for industrial purposes.

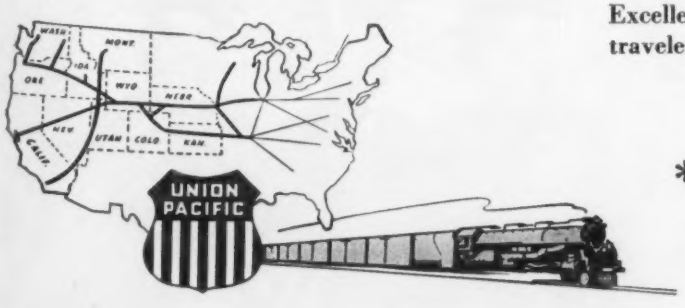
The state's tremendous yield of fruits and vegetables, together with seafood, offers an immediate supply to concerns engaged in processing and packing.

Washington's population has shown a great growth; providing a large local consumer market and source of industrial workers.

The state also is a gateway to the Orient for export business.

From a viewpoint of good living, the Evergreen State offers a year 'round scenic playground . . . excellent educational and cultural advantages.

Excellent rail transportation, for shippers and travelers, is provided by Union Pacific.



* *Address Industrial Department, Union Pacific Railroad, Omaha 2, Nebraska, for information regarding industrial sites.*

UNION PACIFIC RAILROAD

THE STRATEGIC MIDDLE ROUTE

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PROFILES

Carroll V. Roseberry, new assistant Pacific Coast district manager for Westinghouse, central station division

Jack Totten, recently named vice-president of Remler company, San Francisco manufacturer of radio equipment

Left: Stephen A. Ceruti, now Apex manager in San Francisco. He has been with the company since 1937, with time out during the war for service with 71st Armored Field Artillery Battalion

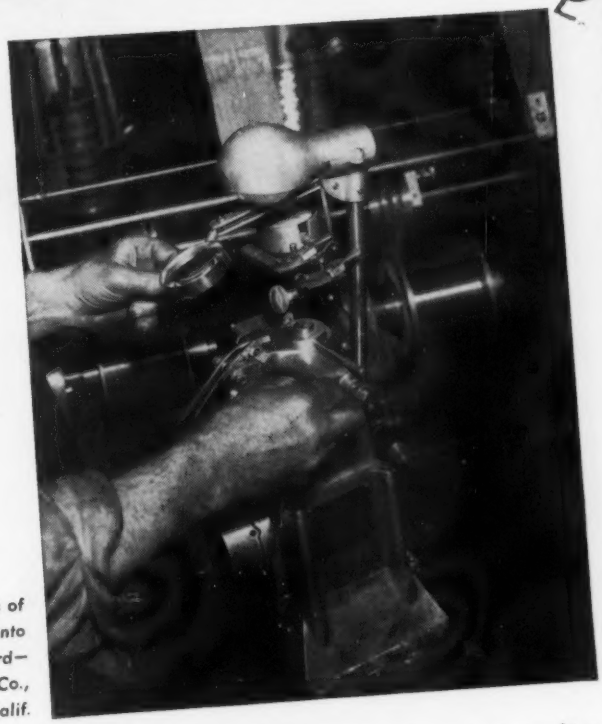
Below: Five of Puget Power's top men were guests at the inauguration of Dr. Raymond B. Allen as president of the University of Washington. They are from left: E. C. Branch, commercial & industrial sales director; Charles F. Terrill, vice-president and representing the AIEE; Dr. L. N. Robinson, engineer; Pat Johnson, vice-president; S. P. McFadden, company consultant

Footnotes* ...to the California Scene

SCENE 6:

BREADWINNING

Public Interest No. 1



Welding ends of wire for stranding into aircraft cord—Columbia Steel Co., Pittsburg, Calif.

California workers earn the nation's highest wages. Our per capita income last year was **over $1,500,** compared to the U. S. average of $1,162. The answer lies in the greater need for skilled workers here—especially in Northern California. Skilled workers, operating efficient power tools, produce more per man, and hence earn more pay. This is a healthy condition...one where everyone benefits...and puts Northern California in first place for the breadwinner.*

*Not the least factor of importance in determining the growth of high-grade industry is the availability of low-cost power. Throughout Northern and Central California P.G. and E. delivers reliable, plentiful power at rates among the nation's lowest. Manufacturers find it economical to use more power tools, which means higher wages and a better standard of living for us all.

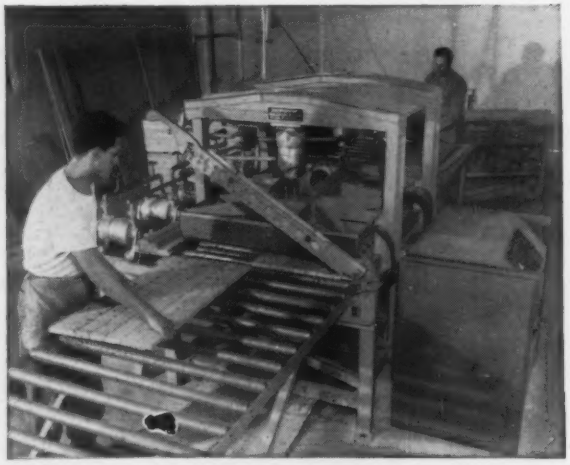
P·G·and E· PACIFIC GAS AND ELECTRIC COMPANY

"Always a leader in the progress of Northern California"

EW—108-847

Adventures in Radio Frequency Heating...

GLUE SETTING



Operator removing a finished piece from the press. The 5 KW radio frequency generator is on the right. These pictures taken at Brown-Saltman Furniture Co., South Gate, Calif. (Courtesy *Westinghouse*)

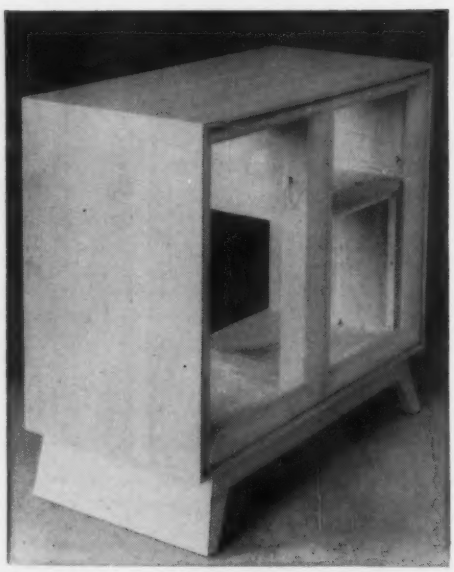
Operator making adjustment for different size and type of assembly. Interior of radio frequency generator shown. Glue-setting time here averages 30 seconds, geared to other production operations.

R. F. HEATING *boosts* *Furniture Output*

Furniture manufacturers are discovering how Radio Frequency heating equipment can increase production by shortening the glue setting time during assembly. The increase in production per man varies between 30 and 200 per cent, depending on the type of assemblies being glued.

The Brown-Saltman Company uses the R.F. glue clamp shown here on a variety of materials and interchanges these loads during the operating period. Poplar, mahogany and ash are used in assemblies varying from 18 x 14 x 2 inches to 44 x 20 x 15/16 inches thick. In some cases the assemblies are core stock and in other cases they are solid stock.

Your local utility engineers can give you additional information about applications of R.F. heating in numerous industries.



The ends, top, shelf and bottom of this solid mahogany radio cabinet were made in the radio frequency glue clamp. Initial cost of clamp is higher than manual type, but is not excessive compared to a motor-operated rotary clamp.

PACIFIC COAST ELECTRICAL ASSOCIATION
447 SUTTER STREET, SAN FRANCISCO 8 601 WEST FIFTH STREET, LOS ANGELES 13